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SIPR Environmental Monitoring Report 1

Grangegorman Development Agency

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GRANGEGORMAN



SITE INFRASTRUCTURE & PUBLIC REALM WORKS

Environmental Monitoring Report No 1

Noise, Vibration & Dust

DOCUMENT REFERENCE RB-GDA-EMR-01

<i>Rev</i>	<i>Date</i>	<i>Reason for Revision</i>
R01	17-12-2013	Issued for Review

<i>Authorisation Record</i>		<i>Roadbridge</i>	<i>Roadbridge</i>	<i>Clients Representative</i>
				
<i>R01</i>	<i>17-12-2013</i>	<i>T Cosgrave</i>	<i>A O Rourke</i>	<i>B O Rourke</i>
<i>Rev</i>	<i>Date</i>	<i>Prepared by</i>	<i>Recommended by</i>	<i>Received by</i>

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1.0 Introduction

Environmental Measurements (EM), Unit 12, Tallaght Business Centre, Whitestown Business Park, Dublin 25, have been appointed to carry out Noise, Vibration & Dust monitoring on behalf of Roadbridge.

All monitoring shall be carried out in accordance with Method Statement RB-GDA-MS-26.

Data included in this report relates to three locations where monitoring has been carried out.

The monitoring station locations were jointly agreed between OCSC, RB & EM which are:-

- Station 1 – Next to the Laundry Building
- Station 2 – Next to the Mortuary Building
- Station 3 – Next to the C of I Church

A schedule of Environmental monitoring stations and a location map are included in this report, which details location, set up, download & removal dates.

As agreed a fourth station was setup on the 9th of Dec by where, the equipment from station 1 was removed and placed at the Energy Building adjacent to the Phoenix Centre. Data for this location shall be included in next month's report.

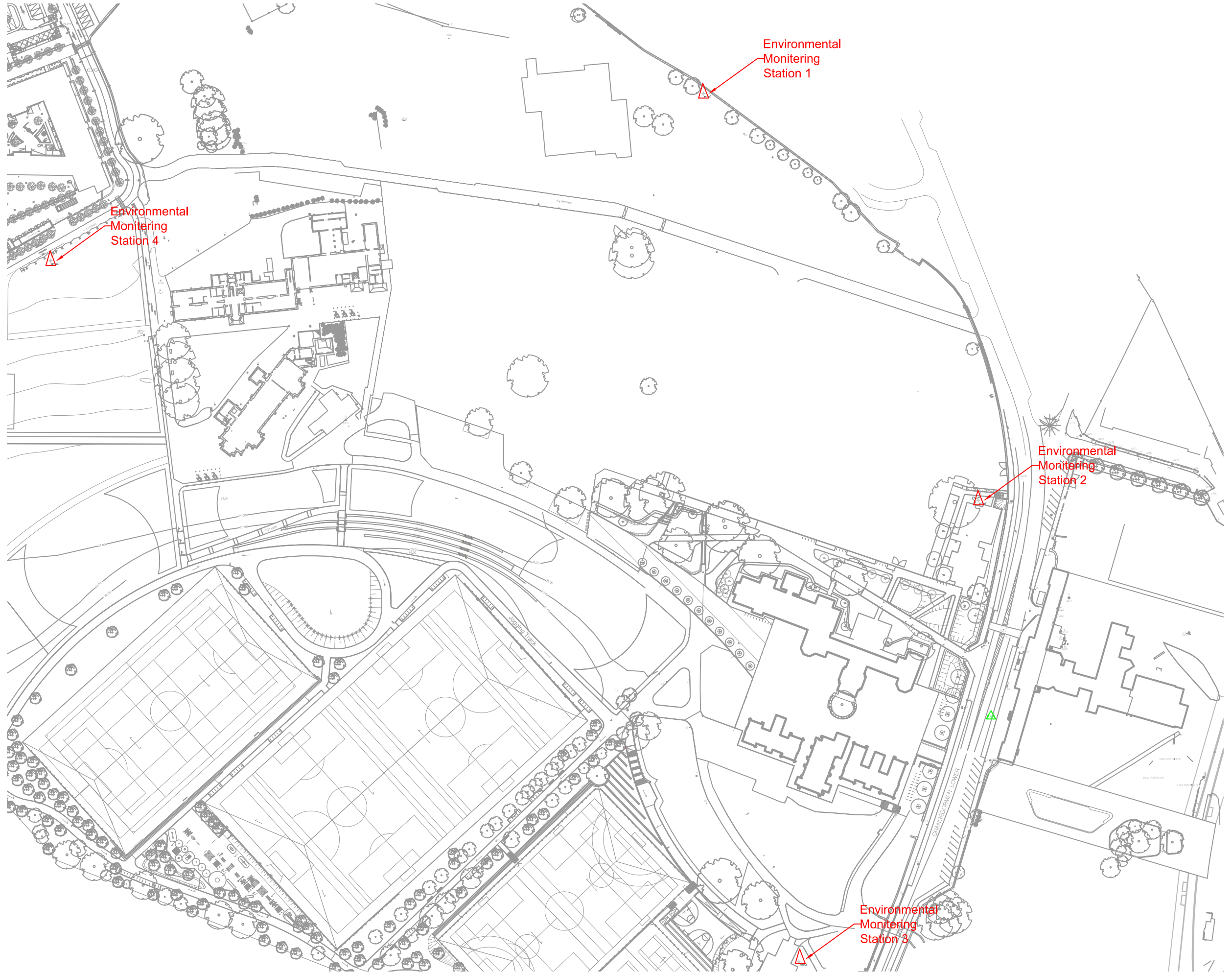
Dust monitoring has been setup and the same four locations, by means of Bergerhoff Dust Deposit Gauge. Dust samples shall be collected over 28 day periods and sent for analysis. First analysis shall be early January.

2.0 Related Documents

- Conditions set out in Planning Grant Order No. P2693
- Volume A – Works Requirements, Specification Appendix 1/9 & 29
- EIS Volume 2 (mainly chapter 8)
- Method Statement RB-GDA-MS-26

3.0 Schedule of Environmental Monitoring Stations

4.0 Location map of Environmental Monitoring Stations



5.0 Environmental Measurements Monitoring Reports

**Report Noise and Vibration Stn.1 Laundry Building
Grangegorman**

for Roadbridge

Project: Site Infrastructure & Public Realm Works

Monitoring Period: 26 Nov 2013 to 9 Dec 2013

Revision	Prepared By	Date	Approved	Date
01	K. O'Brien	9 Dec 2013	MH	10 Dec 2013

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1. Introduction

At the request of Roadbridge, our company Environmental Measurements has carried out noise and vibration monitoring at the Laundry Building, Grangegorman, Dublin.

The purpose of the survey was to:

1. Measure the noise and vibration levels impacting on the Laundry Building while Roadbridge carried out works as part of the Grangegorman redevelopment.

2. Methodology

2.1 Vibration

One InstanTel Model MiniMate Plus vibration monitor was installed at the Laundry Building.

This monitor is a triaxial velocity meter which measures peak particle velocity (ppv) in mm/sec together with the frequency at peak. This allows for the calculation of acceleration and displacement at peak.

A specification sheet for the InstanTel Model Mini Mate Plus accompanies this report.

2.2 Noise

One Larson Davis Model 812 noise monitor was installed at the Laundry Building.

This monitor is an integrating sound level meter which measures the standard sound level parameters of Leq, Max, Min, Pk, UnwPk and Lns.

A specification sheet for the Larson Davis Model 812 accompanies this report.

3. Results

3.1.1 Vibration : Located at the Laundry Building, Grangegorman.

Monitoring covers the period from 26 Nov 2013 to 9 Dec 2013. A Peak Particle Velocity (PPV) of 2.92mm/sec was recorded during this monitoring run.

This level is below the level of vibration required to have potential for cosmetic damage.
Ref: BS 7385 Part 2 1993 Evaluation and measurement for vibration in buildings.



Event Report

Histogram Start Time	09:50:08 November 26, 2013	Serial Number	BE10439 V 10.60-8.17 MiniMate Plus
Histogram Finish Time	09:11:50 November 28, 2013	Battery Level	6.9 Volts
Number of Intervals	568 at 5 minutes	Calibration	November 20, 2013 by Instantel
Range	Geo :254 mm/s	File Name	L439F30W.NK0
Sample Rate	1024sps		
Job Number:	1		

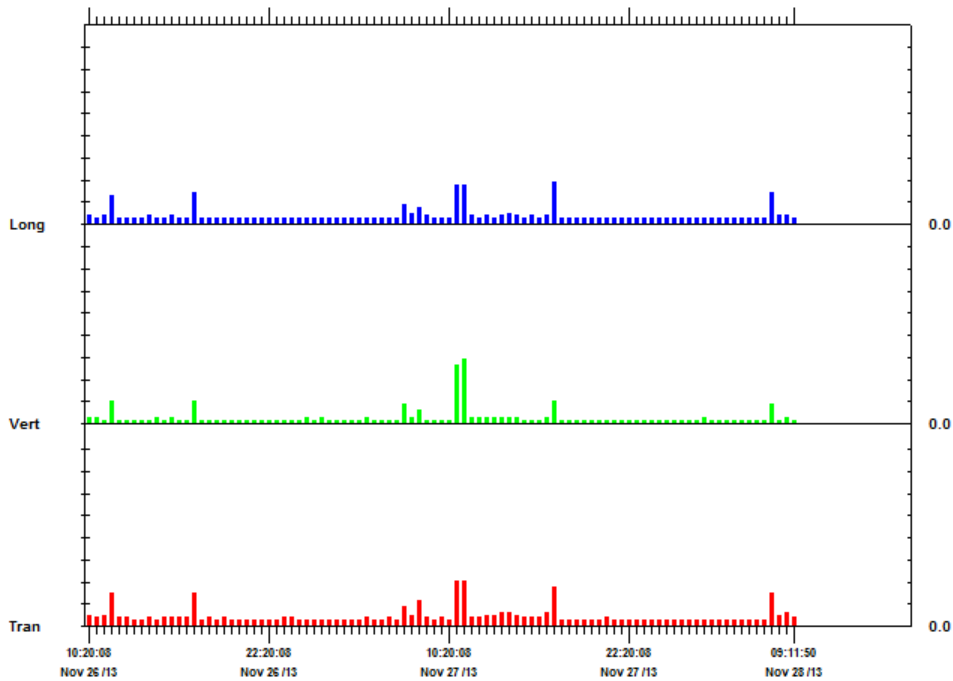
Notes

Post Event Notes

Client: Roadbridge
 Location: The Laundry Bdg, Grangegorman
 User: Environmental Measurements

	Tran	Vert	Long	
PPV	2.03	2.92	1.90	mm/s
ZC Freq	30	51	23	Hz
Date	Nov 27 /13	Nov 27 /13	Nov 27 /13	
Time	10:50:08	11:00:08	17:00:08	
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 3.06 mm/s on November 27, 2013 at 11:00:08



Time Scale: 30 minutes /div Amplitude Scale: Geo: 1.000 mm/s/div
 Printed: December 13, 2013 (V 8.12 - 8.12) Format Copyrighted 2006-2007 Instantel, a division of VeriChip Corporation



Event Report

Histogram Start Time	09:18:05 November 28, 2013	Serial Number	BE10439 V 10.60-8.17 MiniMate Plus
Histogram Finish Time	14:34:16 December 9, 2013	Battery Level	6.9 Volts
Number of Intervals	3231 at 5 minutes	Calibration	November 20, 2013 by Instantel
Range	Geo :254 mm/s	File Name	L439F34K.I50
Sample Rate	1024sps		
Job Number:	1		

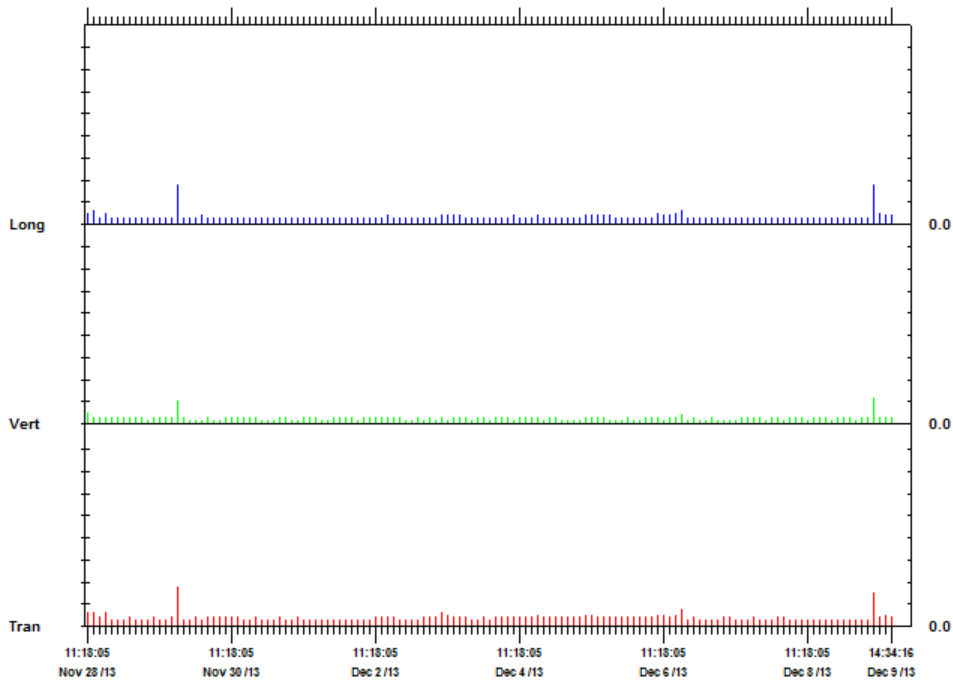
Notes

Post Event Notes

Client: Roadbridge
 Location: The Laundry Bdg, Grangegorman
 User: Environmental Measurements

	Tran	Vert	Long	
PPV	1.78	1.14	1.78	mm/s
ZC Freq	27	37	24	Hz
Date	Nov 29 /13	Dec 9 /13	Nov 29 /13	
Time	16:28:05	07:43:05	16:28:05	
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 2.20 mm/s on November 29, 2013 at 16:28:05



Time Scale: 2 hours /div Amplitude Scale: Geo: 1.000 mm/s/div
 Printed: December 13, 2013 (V 8.12 - 8.12) Format Copyrighted 2006-2007 Instantel, a division of VeriChip Corporation

3.2.1 Noise : Located at the Laundry Building, Grangegorman.

Monitoring covers the period from 26 Nov 2013 to 9 Dec 2013.

Date	Time	Duration	Leq	Lmax	Lmin	L(5)	L(10)	L(90)	L(95)
26Nov 13	09:36:03	1436.4	69.5	91.8	43.5	74.1	72.7	58.4	53.8
26Nov 13	10:00:00	3600	69.7	84.6	43.4	77.3	75.8	45.9	45.1
26Nov 13	11:00:00	3600	72.7	85.2	50.4	77.8	76.7	55	53.8
26Nov 13	12:00:00	3600	65.7	79.7	42.8	72	70.1	48.8	46.5
26Nov 13	13:00:00	3600	53.8	74.9	40.9	58.2	56	44.4	43.5
26Nov 13	14:00:00	3600	61	83.3	48.2	66.3	65	52.5	52
26Nov 13	15:00:00	3600	66.9	87.4	50.8	72.5	69.8	55.6	54.5
26Nov 13	16:00:00	3600	65.5	87.4	46.9	70.8	66.5	51.6	50.3
26Nov 13	17:00:00	3600	53	75	44.6	57.1	55	46.6	46.2
26Nov 13	18:00:00	3600	48.9	68.2	44.4	52.3	50	45.6	45.3
26Nov 13	19:00:00	3600	48.4	67.6	43.8	52.6	50.1	45.2	45
26Nov 13	20:00:00	3600	48	63.5	42.6	53.1	49.9	44.1	43.6
26Nov 13	21:00:00	3600	46.4	63.5	41.6	49.7	47.4	43.3	43.1
26Nov 13	22:00:00	3600	45.1	66.7	38.9	47.9	47.3	41	40.5
26Nov 13	23:00:00	3600	42.3	59	37.4	44.5	43.1	39.7	39.3
27Nov 13	00:00:00	3600	42	60.9	36.6	44	42.9	39	38.4
27Nov 13	01:00:00	3600	39.1	55	33.7	41.5	40.7	36.9	36.3
27Nov 13	02:00:00	3600	37	53.1	32.5	39.3	38.5	34.8	34.3
27Nov 13	03:00:00	3600	37.8	55.5	32.7	40.4	39	34.9	34.4
27Nov 13	04:00:00	3600	39.9	57.6	33.8	42.2	41.2	36.1	35.6
27Nov 13	05:00:00	3600	42.7	59.5	36.8	45.4	44.6	39.4	38.8
27Nov 13	06:00:00	3600	49	71.1	41.4	52.5	49.1	43.7	43.2
27Nov 13	07:00:00	3600	63.9	86.6	44.8	69.5	66.1	47.9	47
27Nov 13	08:00:00	3600	62.7	91.8	47.8	66.5	63.5	53.2	52.2
27Nov 13	09:00:00	3600	62	85.4	43.5	67.5	63.9	50.8	49
27Nov 13	10:00:00	3600	71.5	98.2	42.1	64.9	59.5	45.6	44.8
27Nov 13	11:00:00	3600	64.6	86.3	47.9	70.4	67.7	55.1	52.9
27Nov 13	12:00:00	3600	62.1	79.1	44.9	66.8	64.6	55.1	53.9
27Nov 13	13:00:00	3600	59.6	79.2	41	64.3	62.9	45.4	44.1
27Nov 13	14:00:00	3600	60.9	78.8	52.8	64.4	62.9	56.4	55.6
27Nov 13	15:00:00	3600	59.7	72.2	52.4	63.8	62.6	55.2	54.5
27Nov 13	16:00:00	3600	66.4	89.4	45.8	66	64.5	53.7	51.4
27Nov 13	17:00:00	3600	49.7	72.5	40.4	54.9	52.8	43.6	42.5
27Nov 13	18:00:00	3600	49.5	67.6	41.5	56.2	53.4	43.4	43.1
27Nov 13	19:00:00	3600	49.4	65.5	40.9	55.8	53.2	43.2	42.7

27Nov 13	20:00:00	3600	47	75.6	40.1	52.5	49.7	41.7	41.3
27Nov 13	21:00:00	3600	45.3	65.9	38.6	49.8	46.6	40.7	40.2
27Nov 13	22:00:00	3600	43.1	60.6	38.3	46.3	43.9	39.9	39.4
27Nov 13	23:00:00	3600	42.9	63.2	34.9	46.1	43.3	37.9	37.3
28Nov 13	00:00:00	3600	41.5	69	33.3	42.5	40.9	36	35.4
28Nov 13	01:00:00	3600	35.7	58.8	29.4	38.7	37.5	31.9	31.3
28Nov 13	02:00:00	3600	35.9	62.1	29	38.4	36.4	31.3	31
28Nov 13	03:00:00	3600	35.3	55.9	29.9	37.7	36.8	32.6	32.2
28Nov 13	04:00:00	3600	37	57	31.6	40	39	33.9	33.4
28Nov 13	05:00:00	3600	40.2	58.8	33.8	43.1	42.4	36.7	36.1
28Nov 13	06:00:00	3600	48	62.1	37.9	52.7	51.6	40.6	40.1
28Nov 13	07:00:00	3600	64	88	49.3	66.3	63.2	50.9	50.4
28Nov 13	08:00:00	3600	61.9	82.3	49.1	65.2	63.1	55.4	54.2
28Nov 13	09:00:00	1192.6	66.1	84.6	54	72.2	67.7	57.1	56.2
28Nov 13	09:29:35	1824.4	57.7	70.8	41.1	61.6	60.6	46.1	44.4
28Nov 13	10:00:00	3600	59.6	83.5	40.2	63.3	61.2	44.8	43.6
28Nov 13	11:00:00	3600	60.7	85.1	49.9	64.1	61.8	53.7	52.7
28Nov 13	12:00:00	3600	59.4	80.5	46.2	62.5	60.1	52.4	51.6
28Nov 13	13:00:00	3600	60.1	77.9	37.4	65.5	63.5	46.1	42.8
28Nov 13	14:00:00	3600	61.4	80.8	48.2	66.2	64.4	53.5	52.4
28Nov 13	15:00:00	3600	62.2	83.3	44.6	67	64.1	50.5	48.6
28Nov 13	16:00:00	3600	59.5	77.3	45.7	63.4	61.2	54.1	53.2
28Nov 13	17:00:00	3600	57.4	74.3	42.5	63.4	60.2	46.7	45.7
28Nov 13	18:00:00	3600	51.2	67.7	41.7	57	55.5	43.6	43.2
28Nov 13	19:00:00	3600	48.1	65.8	41	53.3	50.5	42.4	42.1
28Nov 13	20:00:00	3600	47.5	72.2	40.8	52.8	49.4	42.6	42.2
28Nov 13	21:00:00	3600	46.4	63	40.4	50.9	48	42	41.6
28Nov 13	22:00:00	3600	45.9	66.9	40.4	49.3	46.7	42.2	41.9
28Nov 13	23:00:00	3600	44	59.5	40.7	45.9	45.3	42.3	42.1
29Nov 13	00:00:00	3600	43.6	62.4	39.4	45.8	44.9	41.4	41
29Nov 13	01:00:00	3600	43.3	61.2	38.9	45.8	44.1	40.5	40.2
29Nov 13	02:00:00	3600	42	59.5	38.2	44.1	43.5	40.2	40
29Nov 13	03:00:00	3600	42.7	61.4	37.6	45.1	44.1	40.2	39.7
29Nov 13	04:00:00	3600	43.6	59.7	38.7	45.9	44.6	40.5	40.1
29Nov 13	05:00:00	3600	44.3	58.8	39.8	46.3	45.8	42.1	41.5
29Nov 13	06:00:00	3600	48.3	58.5	43.5	50.8	50.1	45.5	45
29Nov 13	07:00:00	3600	57.6	80.9	48.6	61.5	59.7	52.3	51.7
29Nov 13	08:00:00	3600	59.9	80	51	64.2	61.7	54.3	53.5
29Nov 13	09:00:00	3600	58.5	76.6	46	62.9	60.5	52	51.1
29Nov 13	10:00:00	3600	54.1	76.1	44.4	58.4	56.5	46.6	46
29Nov 13	11:00:00	3600	57.1	77.9	48.2	61.2	59.3	51.4	50.7
29Nov 13	12:00:00	3600	55.7	76.9	45.5	59.5	58.1	50.6	49.7
29Nov 13	13:00:00	3600	54.7	75	44.9	59.4	56.8	47.5	46.9
29Nov 13	14:00:00	3600	58.9	83.8	47.6	62.7	60.3	50.7	50.1

29Nov 13	15:00:00	3600	55.2	75.7	47.4	59.6	58	50.3	49.7
29Nov 13	16:00:00	3600	64.8	88.5	45	61.6	59	49.1	47.4
29Nov 13	17:00:00	3600	49.7	66.7	44.3	54.3	52.2	45.9	45.4
29Nov 13	18:00:00	3600	50	65.9	44.8	54.3	52.3	46.5	46.2
29Nov 13	19:00:00	3600	49.9	71.3	43.3	53.9	51.5	45.8	45.3
29Nov 13	20:00:00	3600	48.9	68.1	44	52.9	50.6	45.7	45.2
29Nov 13	21:00:00	3600	46.9	60.8	42.9	49.6	48.2	44.6	44.2
29Nov 13	22:00:00	3600	45.8	63	41.3	49.2	47.3	43.1	42.6
29Nov 13	23:00:00	3600	44.5	60.5	40.8	46.8	45.7	42.3	42.1
30Nov 13	00:00:00	3600	44.9	61.3	40.4	46.9	46	42.6	42.2
30Nov 13	01:00:00	3600	43.6	61.5	38.5	46	45.1	40.8	40.3
30Nov 13	02:00:00	3600	44.4	61.2	38.7	47	45.6	41.2	40.8
30Nov 13	03:00:00	3600	42.5	58.9	39.1	44	43.6	40.9	40.4
30Nov 13	04:00:00	3600	42.4	59.7	38.5	44	43.4	40.4	40.1
30Nov 13	05:00:00	3600	42.3	59.1	38.6	44.1	43.6	40.4	40.1
30Nov 13	06:00:00	3600	45.6	61.3	39.1	49.3	46.9	42.1	41.6
30Nov 13	07:00:00	3600	48.1	66.8	41.9	52.3	50.3	43.9	43.4
30Nov 13	08:00:00	3600	51.5	79.4	41.8	54.7	51.6	45	44.4
30Nov 13	09:00:00	3600	49.2	82.1	43.6	51.5	49.5	45.1	44.7
30Nov 13	10:00:00	3600	48.4	69.9	41.4	53.5	51.3	43.6	43.1
30Nov 13	11:00:00	3600	49	68.8	41.2	54.2	51.5	42.9	42.4
30Nov 13	12:00:00	3600	48.4	63.9	39.6	54.1	51.8	42.7	42.2
30Nov 13	13:00:00	3600	48.1	64.4	39	53.5	50.7	41.7	41.1
30Nov 13	14:00:00	3600	47.7	66.4	39.9	53.2	50.6	42.2	41.6
30Nov 13	15:00:00	3600	47.3	64.8	40.5	52.4	49.6	42.5	42.1
30Nov 13	16:00:00	3600	48	64.5	41.6	53.1	50.4	43.5	43.1
30Nov 13	17:00:00	3600	47.7	64.7	41.6	52.5	49.7	43.4	43.1
30Nov 13	18:00:00	3600	47.8	77.3	39.7	50.7	47.8	42.2	41.6
30Nov 13	19:00:00	3600	45.2	64.3	39.1	49.5	46.1	41.2	40.8
30Nov 13	20:00:00	3600	46.4	63.1	38.8	51.6	47.9	40.6	40.2
30Nov 13	21:00:00	3600	44.3	64	38.7	47.9	45.4	40.3	40.1
30Nov 13	22:00:00	3600	43.3	61.8	38.1	46.5	44.3	40	39.5
30Nov 13	23:00:00	3600	42.5	60	36.8	45.6	43.8	39.5	39.2
01Dec 13	00:00:00	3600	45.8	68.7	37.5	49.2	44.7	39.1	38.6
01Dec 13	01:00:00	3600	41.5	59.3	37.4	43	42.2	39.3	39.1
01Dec 13	02:00:00	3600	43	68.7	37.6	44.2	43	39.7	39.3
01Dec 13	03:00:00	3600	41.7	57	37.7	43.2	42.7	40.1	39.6
01Dec 13	04:00:00	3600	41.6	59.6	35.9	43.7	42.8	38.2	37.7
01Dec 13	05:00:00	3600	40	60.5	35.1	41.9	41.1	37.2	36.7
01Dec 13	06:00:00	3600	41.9	60.3	34.6	45.2	43.6	37.7	37.2
01Dec 13	07:00:00	3600	44.9	68.2	38.3	48.6	46.8	40.4	40
01Dec 13	08:00:00	3600	45.1	65.2	38.2	48.2	46.8	41.1	40.5
01Dec 13	09:00:00	3600	45.7	73.7	40.1	50.2	47	41.6	41.2
01Dec 13	10:00:00	3600	47.8	69.7	39.6	51.9	48.7	41.3	41.1

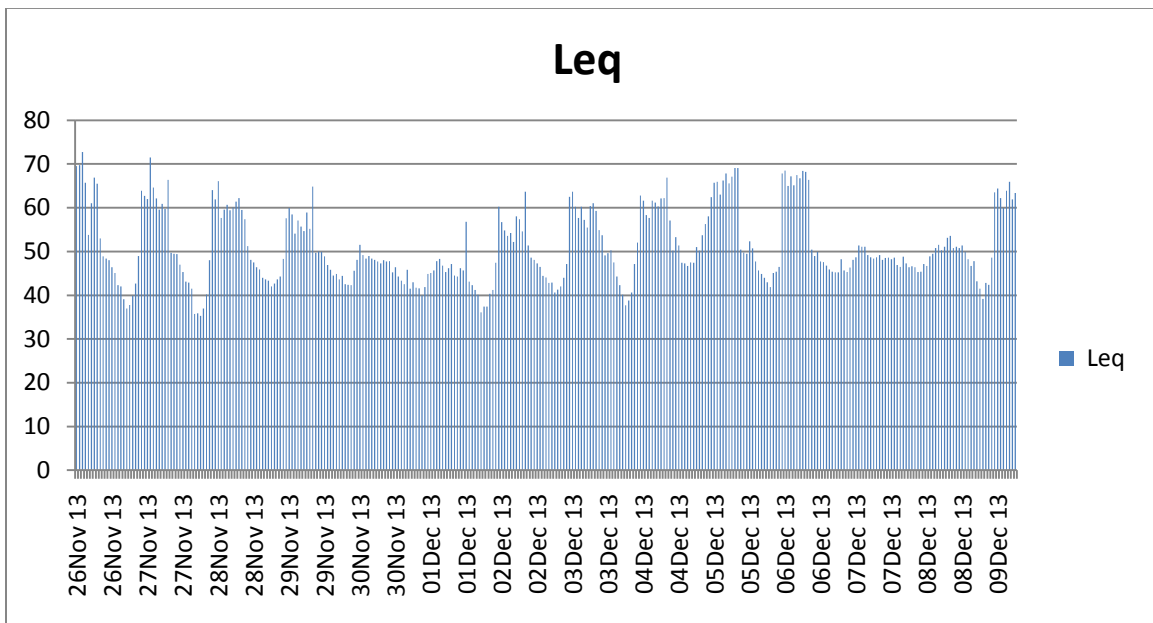
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01Dec 13	12:00:00	3600	46.8	65.2	34.5	52.8	50	37.5	36.8
01Dec 13	13:00:00	3600	45.3	61.9	34.2	51.4	48.6	37.2	36.5
01Dec 13	14:00:00	3600	46.2	64.1	32.5	52.3	49.6	36.3	35.3
01Dec 13	15:00:00	3600	47.1	66	30.3	53.5	50.4	35	33.9
01Dec 13	16:00:00	3600	44.5	63.6	29.4	50.2	47.8	34.1	33
01Dec 13	17:00:00	3600	44.3	61.9	31.8	49.7	47.3	37.1	36
01Dec 13	18:00:00	3600	46.2	66.8	34.8	51.7	48.4	37	36.4
01Dec 13	19:00:00	3600	45.7	69.2	32.6	51.3	47.5	35.4	35
01Dec 13	20:00:00	3600	56.8	79.7	32.5	64.2	59.5	36.4	35.5
01Dec 13	21:00:00	3600	43.1	65.4	32.6	48.4	45.2	35	34.4
01Dec 13	22:00:00	3600	42.3	63.9	30.7	47.3	43.6	33.5	33
01Dec 13	23:00:00	3600	41.2	67.1	31.9	43.7	40.9	34.5	34.1
02Dec 13	00:00:00	3600	40.1	70.5	29	43.6	41	31.5	31
02Dec 13	01:00:00	3600	36.1	56.5	30.2	37.7	36.8	32.8	32.2
02Dec 13	02:00:00	3600	37.4	58.5	28.2	37.4	36	30.2	29.8
02Dec 13	03:00:00	3600	37.4	56.2	30.1	39.7	39	33.6	32.5
02Dec 13	04:00:00	3600	40.3	63.6	32.6	41.4	39.2	34.7	34.2
02Dec 13	05:00:00	3600	41.2	64.8	33.8	43.9	43.3	36	35.3
02Dec 13	06:00:00	3600	47.4	59.6	41.8	50.2	49	44.2	43.5
02Dec 13	07:00:00	3600	60.2	92.9	46.2	63.2	60.8	50.6	49.3
02Dec 13	08:00:00	3600	56.7	80.6	48.3	60.2	59	51.8	51
02Dec 13	09:00:00	3600	54.8	72.6	45.1	58.9	57.7	49.8	49.1
02Dec 13	10:00:00	3600	53.6	72.7	42.3	58.3	55.9	46.3	45.3
02Dec 13	11:00:00	3600	54.2	73.4	43.9	58.3	56.7	47.6	47
02Dec 13	12:00:00	3600	52.2	69	41.6	56.6	55.1	46.1	45.1
02Dec 13	13:00:00	3600	58	86.6	39.8	61.1	57.7	44.1	42.9
02Dec 13	14:00:00	3600	57.4	76.5	47.1	60.6	58.2	50.3	49.6
02Dec 13	15:00:00	3600	54.6	76.7	47	58	56.7	50.1	49.4
02Dec 13	16:00:00	3600	63.7	90.4	45.6	68.8	63	50.9	50.2
02Dec 13	17:00:00	3600	51.4	78.1	41.4	56	53.7	43.3	42.8
02Dec 13	18:00:00	3600	48.6	70	40.4	53.7	50.4	42.1	41.8
02Dec 13	19:00:00	3600	48.1	65.2	41.1	53	51.2	42.8	42.3
02Dec 13	20:00:00	3600	47.3	64.7	41.7	52.1	49.1	43.2	43
02Dec 13	21:00:00	3600	46.5	73.7	41.1	49.9	47.8	43	42.4
02Dec 13	22:00:00	3600	44.4	58	40.6	46.9	45.7	42.4	42.1
02Dec 13	23:00:00	3600	44.1	57.3	40.9	46	45.4	42.3	42.1
03Dec 13	00:00:00	3600	42.8	60.7	38.9	45	43.9	40.6	40.3
03Dec 13	01:00:00	3600	42.9	69.1	36.1	42	41	37.6	37.3
03Dec 13	02:00:00	3600	40.6	57	36.2	42.9	41.8	38.2	38
03Dec 13	03:00:00	3600	41.3	52.3	37.5	43.4	42.7	39.4	39.1
03Dec 13	04:00:00	3600	42	59.6	37.6	43.9	43.1	39.7	39.3
03Dec 13	05:00:00	3600	44	61.1	39.4	46.3	45.3	41.4	41
03Dec 13	06:00:00	3600	47.1	61.3	41.7	49.7	48.7	44.2	43.6

03Dec 13	07:00:00	3600	62.5	86.5	46	67.1	61.7	48.1	47.5
03Dec 13	08:00:00	3600	63.7	95.2	50.2	66.4	62.7	53.6	53
03Dec 13	09:00:00	3600	60.2	81	49.2	65.5	60.9	52	51.3
03Dec 13	10:00:00	3600	57.7	80	45.5	61.5	58.3	47.4	47.1
03Dec 13	11:00:00	3600	60.2	80.5	50.4	65	61.5	53.2	52.6
03Dec 13	12:00:00	3600	57.2	77.4	44.6	60.4	58.3	52.1	51.2
03Dec 13	13:00:00	3600	55.5	77.1	44.3	59.5	57.5	46.5	45.9
03Dec 13	14:00:00	3600	60.4	77.5	50	65.5	61.5	52.8	52.1
03Dec 13	15:00:00	3600	61	82.1	49.3	65.5	62.6	52.5	51.8
03Dec 13	16:00:00	3600	59.3	79.2	49.1	63.1	60.3	51.9	51.3
03Dec 13	17:00:00	3600	54.9	77.5	44.5	58.9	56.5	46.7	46.2
03Dec 13	18:00:00	3600	53.7	70	44.6	57.4	56.6	46.5	46.1
03Dec 13	19:00:00	3600	49.1	64.9	44.7	53.3	50.8	46.2	46.1
03Dec 13	20:00:00	3600	49.6	65.4	44.2	55.3	51.9	46.2	46
03Dec 13	21:00:00	3600	50.3	69	44	55.9	54.1	45.5	45.2
03Dec 13	22:00:00	3600	47.5	67.2	42	51.6	49	44	43.5
03Dec 13	23:00:00	3600	44.3	59.2	38	47.3	46.2	41.2	40.5
04Dec 13	00:00:00	3600	42.3	62.8	35.5	44.7	43.2	37.4	37
04Dec 13	01:00:00	3600	40.1	65.3	34.2	42.3	40.6	35.7	35.3
04Dec 13	02:00:00	3600	37.7	55.3	33.6	40.4	39.3	35.3	35.1
04Dec 13	03:00:00	3600	38.8	57.4	33.8	41	39.9	35.7	35.3
04Dec 13	04:00:00	3600	40.6	59.3	34.8	42.8	41.4	37.2	36.5
04Dec 13	05:00:00	3600	47.1	66	37.1	53.9	48.2	39.3	38.7
04Dec 13	06:00:00	3600	52	65.7	40.7	58.2	56.3	43.9	43
04Dec 13	07:00:00	3600	62.8	91.3	45.8	65.3	62.4	49.2	48
04Dec 13	08:00:00	3600	61.6	77.9	51.5	67.3	63.9	54.2	53.4
04Dec 13	09:00:00	3600	58.3	71.7	47.4	62.5	61.1	52.6	51.1
04Dec 13	10:00:00	3600	57.7	77.5	45.8	62.1	60.2	47.8	47.3
04Dec 13	11:00:00	3600	61.6	79.5	49.4	66.7	63.9	53.4	52.6
04Dec 13	12:00:00	3600	61.2	81.1	47.6	66.7	63.5	52.3	51.2
04Dec 13	13:00:00	3600	60.3	83.2	47.5	64	61.2	54	53
04Dec 13	14:00:00	3600	62.1	79.6	50.3	67.2	64	54.2	53.2
04Dec 13	15:00:00	3600	62.2	90.7	50.4	66.6	64	54.2	53.3
04Dec 13	16:00:00	3600	66.9	87.9	50.4	72.6	68.5	57.2	56
04Dec 13	17:00:00	3600	57.1	75.6	46.4	62.1	60.9	48.1	47.5
04Dec 13	18:00:00	3600	50.2	65.5	45.6	54.3	52.3	47.3	47.1
04Dec 13	19:00:00	3600	53.3	69.6	45.8	58.6	57.2	47.6	47.2
04Dec 13	20:00:00	3600	51.4	64.6	44.9	57.2	55.5	46.5	46.2
04Dec 13	21:00:00	3600	47.4	61.8	44.4	49.3	48.4	45.7	45.3
04Dec 13	22:00:00	3600	47.3	59.2	44.6	49.1	48.5	45.8	45.4
04Dec 13	23:00:00	3600	46.7	63.2	42.9	48.9	47.9	44.6	44.3
05Dec 13	00:00:00	3600	47.5	68.1	42.2	50.8	48.9	44.4	44.1
05Dec 13	01:00:00	3600	47.4	70.1	41.1	50.9	49.1	43.5	43
05Dec 13	02:00:00	3600	51	75.1	43.3	54.8	52.7	45.2	44.6

05Dec 13	03:00:00	3600	50.2	69.1	43.1	53.9	52.5	46.1	45.5
05Dec 13	04:00:00	3600	53.7	73.5	45.5	57.9	56.2	48.4	47.8
05Dec 13	05:00:00	3600	56.3	73.4	47.7	60.6	58.9	51.3	50.6
05Dec 13	06:00:00	3600	58	75.4	50.2	62.3	60.4	52.9	52.2
05Dec 13	07:00:00	3600	62.4	78.8	50.8	66.8	64.9	53.9	53.1
05Dec 13	08:00:00	3600	65.7	82.8	56	70.8	68.1	59.3	58.5
05Dec 13	09:00:00	3600	65.9	85.4	51.7	70.2	67.8	57.4	56.1
05Dec 13	10:00:00	3600	63	84.2	50.5	67.7	65.8	54.5	53.5
05Dec 13	11:00:00	3600	66.2	85.5	51.6	70.8	69.1	58.9	57
05Dec 13	12:00:00	3600	67.8	88.6	47.2	72.6	70.7	58.3	55.6
05Dec 13	13:00:00	3600	65.6	83.6	44.2	71.2	69.5	48.2	47.4
05Dec 13	14:00:00	3600	67.1	86.7	54.1	71.6	70.3	57.9	56.7
05Dec 13	15:00:00	3600	69.1	85.2	54.4	72.3	71.6	62.1	59.5
05Dec 13	16:00:00	3600	69.1	88.6	48	72.5	71.7	57.4	55
05Dec 13	17:00:00	3600	50.4	67.3	44.5	55.1	53.1	46.5	46.2
05Dec 13	18:00:00	3600	49.8	66.4	44.2	54.1	51.6	46.1	45.7
05Dec 13	19:00:00	3600	49.5	66.5	43.3	54.4	51.7	45.2	44.7
05Dec 13	20:00:00	3600	52.3	78.4	43	58.3	55.9	45	44.5
05Dec 13	21:00:00	3600	50.7	69.5	42	57.7	55.1	44	43.5
05Dec 13	22:00:00	3600	47.7	67.7	41.7	52.2	48.9	43.4	43.1
05Dec 13	23:00:00	3600	45.7	65	41.2	47.6	46.2	43.2	42.9
06Dec 13	00:00:00	3600	44.9	62.1	40.4	46.8	45.6	42.3	42
06Dec 13	01:00:00	3600	44	66.3	39.4	45.6	44.9	41.6	41.2
06Dec 13	02:00:00	3600	43	60.1	38.3	44.9	44.2	41	40.5
06Dec 13	03:00:00	3600	41.9	68.9	36.9	43.8	42.9	39.4	39.1
06Dec 13	04:00:00	3600	45.1	66.1	37.3	46.2	44	40	39.4
06Dec 13	05:00:00	3600	45.4	67.5	38	46	44.6	40.8	40.3
06Dec 13	06:00:00	3600	46.5	64.5	40.9	48.9	47.8	43.4	42.9
06Dec 13	07:00:00	3600	67.8	91.8	44.1	72.5	71.4	47.1	46.4
06Dec 13	08:00:00	3600	68.5	82.6	56.1	72.5	71.7	58.2	57.5
06Dec 13	09:00:00	3600	65	82.4	52.5	71	69.3	57.5	56.5
06Dec 13	10:00:00	3600	67.2	85.7	45.3	71.6	70.9	48.8	47.8
06Dec 13	11:00:00	3600	65.1	85.8	55.5	70.9	69.3	58.4	57.7
06Dec 13	12:00:00	3600	67.5	84.9	52.9	72.1	71.5	59	58
06Dec 13	13:00:00	3600	66.7	83.5	46.9	72	71.3	50	49.2
06Dec 13	14:00:00	3600	68.4	83.9	54.8	71.9	71.1	59	57.7
06Dec 13	15:00:00	3600	68.2	83.5	54.1	71.4	70.6	58.4	57.5
06Dec 13	16:00:00	3600	66.4	86.7	46.1	71.6	70	48.5	47.7
06Dec 13	17:00:00	3600	50.4	68	44.1	55.2	52.6	45.9	45.4
06Dec 13	18:00:00	3600	49	65.2	44.9	52.8	50.6	46.2	46.1
06Dec 13	19:00:00	3600	49.9	65.8	44.2	54.9	51.8	45.7	45.3
06Dec 13	20:00:00	3600	47.7	64	43.3	51.6	49.3	45	44.5
06Dec 13	21:00:00	3600	47.6	65.1	42.4	52	49.4	44.1	43.6
06Dec 13	22:00:00	3600	46.8	64.9	42.6	49	47.7	44.3	44.1

06Dec 13	23:00:00	3600	45.9	62.4	42.2	47.9	46.9	44	43.5
07Dec 13	00:00:00	3600	45.4	58.8	42.3	47.5	46.4	43.5	43.2
07Dec 13	01:00:00	3600	45.2	57.9	41.9	47	46.1	43.4	43.1
07Dec 13	02:00:00	3600	45.2	64.6	41.4	46.9	46	43.2	43
07Dec 13	03:00:00	3600	48.2	70.1	41.8	50.5	48	43.7	43.3
07Dec 13	04:00:00	3600	45.7	62.3	41.2	47.7	46.7	43.3	43
07Dec 13	05:00:00	3600	45.3	65.3	40.2	46.3	45.4	42.2	42
07Dec 13	06:00:00	3600	46.3	62.4	40.7	50.4	48.1	42.7	42.3
07Dec 13	07:00:00	3600	48.1	71	42.5	52.4	49.9	44.4	44.1
07Dec 13	08:00:00	3600	48.7	66.9	43.2	52.1	50.2	45.2	44.9
07Dec 13	09:00:00	3600	51.4	82.6	43.7	55.7	52.4	46	45.5
07Dec 13	10:00:00	3600	51.1	68.5	45.4	55.6	53.7	47.1	46.6
07Dec 13	11:00:00	3600	51.1	72.9	44.4	55.6	53.4	46.3	46
07Dec 13	12:00:00	3600	49.2	66	43.3	53.5	51.4	45.2	44.9
07Dec 13	13:00:00	3600	48.7	65.3	43.5	53	50.9	45.3	45
07Dec 13	14:00:00	3600	48.4	63.5	43.6	52.6	50.4	45.3	45.1
07Dec 13	15:00:00	3600	48.7	63.9	43.1	53.2	50.8	45.1	44.7
07Dec 13	16:00:00	3600	49.2	63	43.5	54.1	51.5	45.2	44.9
07Dec 13	17:00:00	3600	48.1	63.7	43.8	51.4	49.6	45.4	45.1
07Dec 13	18:00:00	3600	48.5	65.9	44.4	52.1	50	45.7	45.3
07Dec 13	19:00:00	3600	48.6	62.1	44.7	52.1	50.1	46.1	45.8
07Dec 13	20:00:00	3600	48.2	64.3	44.6	51	49.6	46	45.5
07Dec 13	21:00:00	3600	48.6	63.6	43.2	53.2	50.7	44.9	44.4
07Dec 13	22:00:00	3600	46.9	62.7	42.8	50	48.2	44.3	44.1
07Dec 13	23:00:00	3600	46.5	65.6	43.1	48.8	47.7	44.4	44.2
08Dec 13	00:00:00	3600	48.8	70	42.4	53.4	50.3	44.4	44.2
08Dec 13	01:00:00	3600	47.3	69.1	42.4	48.6	47.3	44.1	43.7
08Dec 13	02:00:00	3600	46.4	62.3	42.7	48.5	47.7	44.4	44.1
08Dec 13	03:00:00	3600	46.6	60	43	48.5	47.8	44.7	44.3
08Dec 13	04:00:00	3600	46.4	64.1	41.8	48.7	47.7	44.1	43.6
08Dec 13	05:00:00	3600	45.3	63.8	40.3	47.7	46.6	42.6	42.2
08Dec 13	06:00:00	3600	45.4	61.8	40.7	48.3	46.6	42.4	42.1
08Dec 13	07:00:00	3600	47.1	63.2	41.5	50.8	48.8	43.6	43.2
08Dec 13	08:00:00	3600	46.7	64.1	42.2	49.7	48	44	43.5
08Dec 13	09:00:00	3600	48.9	67	43.8	52.2	50.7	45.6	45.2
08Dec 13	10:00:00	3600	49.5	63.6	44.6	53.3	51.3	46.5	46.2
08Dec 13	11:00:00	3600	50.8	64.5	45.4	55.2	53.4	47.3	47
08Dec 13	12:00:00	3600	51.5	68	45.7	55.4	53.7	48	47.5
08Dec 13	13:00:00	3600	50.3	69.3	45.7	53.8	52.1	47.3	47
08Dec 13	14:00:00	3600	51.1	67.2	46.2	55.1	52.8	48.2	47.9
08Dec 13	15:00:00	3600	53.1	66.9	46.7	58.2	56.9	48.5	48.2
08Dec 13	16:00:00	3600	53.6	70.2	46.9	58.7	57.3	48.9	48.4
08Dec 13	17:00:00	3600	50.8	74.7	46.5	53.8	52.3	48.3	48.1
08Dec 13	18:00:00	3600	51.1	65.9	45.6	54.8	53.3	48.2	48

08Dec 13	19:00:00	3600	50.8	67.8	45.6	54.5	52.7	47.8	47.3
08Dec 13	20:00:00	3600	51.4	70.1	45.5	55.5	53.3	47.7	47.3
08Dec 13	21:00:00	3600	49.9	70	44.8	53.1	51.3	47.1	46.5
08Dec 13	22:00:00	3600	48.2	64.5	43.4	50.6	49.5	45.7	45.2
08Dec 13	23:00:00	3600	46.7	64.5	42.1	49.7	48.3	44	43.5
09Dec 13	00:00:00	3600	47.8	71.4	41.7	50.5	49.3	44.2	43.7
09Dec 13	01:00:00	3600	43.2	59.4	36.5	46.6	45.3	39.5	39.1
09Dec 13	02:00:00	3600	41.5	60.1	37.1	44	42.9	39	38.5
09Dec 13	03:00:00	3600	39.2	58.1	34.7	41.6	40.8	37	36.5
09Dec 13	04:00:00	3600	42.8	66.5	36.2	44.1	42.9	39.1	38.4
09Dec 13	05:00:00	3600	42.4	63.9	37.5	44.5	43.9	39.4	39
09Dec 13	06:00:00	3600	48.6	69.7	41.6	50.3	48.9	43.9	43.3
09Dec 13	07:00:00	3600	63.5	87.3	45.8	67.1	63.3	48	47.4
09Dec 13	08:00:00	3600	64.4	81.4	54.9	69.6	68.1	58	57.1
09Dec 13	09:00:00	3600	62.2	83.8	54	66.8	65.1	57.3	56.3
09Dec 13	10:00:00	3600	59.9	85.9	53	64.3	62.7	54.8	54.4
09Dec 13	11:00:00	3600	63.9	79.1	52.5	68.5	67.1	56.1	55.2
09Dec 13	12:00:00	3600	65.9	85.9	50.5	69.8	68.4	58.8	57.1
09Dec 13	13:00:00	3600	61.9	83.6	46.5	66.4	64.8	50.5	49.7
09Dec 13	14:00:00	2272.6	63.4	82.2	55.4	67.3	65.4	57.7	57



**Report Noise and Vibration Stn.2 Mortuary Building
Grangegorman**

for Roadbridge

Project: Site Infrastructure & Public Realm Works

Monitoring Period: 26 Nov 2013 to 9 Dec 2013

Revision	Prepared By	Date	Approved	Date
01	K. O'Brien	9 Dec 2013	MH	10 Dec 2013

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1. Introduction

At the request of Roadbridge, our company Environmental Measurements has carried out noise and vibration monitoring at the Mortuary Building, Grangegorman, Dublin.

The purpose of the survey was to:

1. Measure the noise and vibration levels impacting on the Mortuary Building while Roadbridge carried out works as part of the Grangegorman redevelopment.

2. Methodology

2.1 Vibration

One InstanTel Model MiniMate Plus vibration monitor was installed at the Mortuary Building.

This monitor is a triaxial velocity meter which measures peak particle velocity (ppv) in mm/sec together with the frequency at peak. This allows for the calculation of acceleration and displacement at peak.

A specification sheet for the InstanTel Model Mini Mate Plus accompanies this report.

2.2 Noise

One Larson Davis Model 812 noise monitor was installed at the Mortuary Building.

This monitor is an integrating sound level meter which measures the standard sound level parameters of Leq, Max, Min, Pk, UnwPk and Lns.

A specification sheet for the Larson Davis Model 812 accompanies this report.

3. Results

3.1.1 Vibration : Located at the Mortuary Building, Grangegorman.

Monitoring covers the period from 26 Nov 2013 to 9 Dec 2013. A Peak Particle Velocity (PPV) of 249mm/sec was recorded during this monitoring run.

Please note that the monitor took an impact during this monitoring period. As a result it would not be reliable to use this data.



Event Report

Histogram Start Time	10:31:44 November 26, 2013	Serial Number	BE9246 V 10.52-8.17 MiniMate Plus
Histogram Finish Time	09:41:06 November 28, 2013	Battery Level	6.9 Volts
Number of Intervals	565 at 5 minutes	Calibration	April 22, 2013 by Instantel
Range	Geo :254 mm/s	File Name	K246F30Y.KW0
Sample Rate	1024sps		

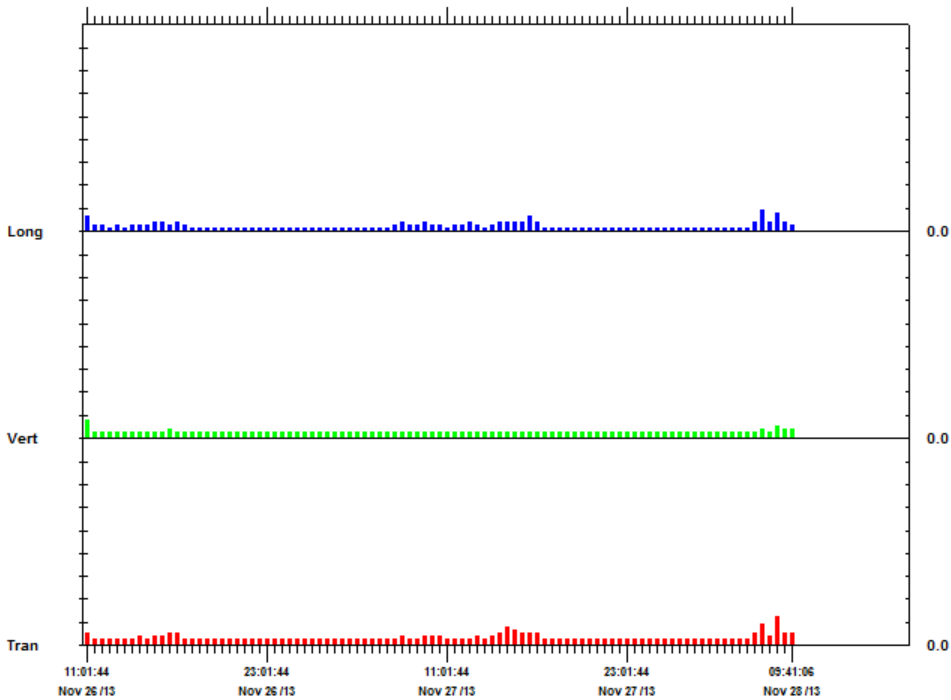
Notes

Post Event Notes

Client: Roadbridge
 Location: The Mortuary Bdg, Grangegorman
 User: Environmental Measurements

	Tran	Vert	Long	
PPV	1.27	0.762	0.889	mm/s
ZC Freq	26	39	34	Hz
Date	Nov 28 /13	Nov 26 /13	Nov 28 /13	
Time	08:41:44	10:36:44	07:41:44	
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 1.44 mm/s on November 28, 2013 at 08:41:44



Time Scale: 30 minutes /div Amplitude Scale: Geo: 1.000 mm/s/div
 Printed: December 13, 2013 (V 8.12 - 8.12) Format Copyrighted 2006-2007 Instantel, a division of VeriChip Corporation



Event Report

Histogram Start Time	09:44:55 November 28, 2013	Serial Number	BE9246 V 10.52-8.17 MiniMate Plus
Histogram Finish Time	15:25:20 December 9, 2013	Battery Level	6.9 Volts
Number of Intervals	3236 at 5 minutes	Calibration	April 22, 2013 by Instantel
Range	Geo :254 mm/s	File Name	K246F34L.QV0
Sample Rate	1024sps		

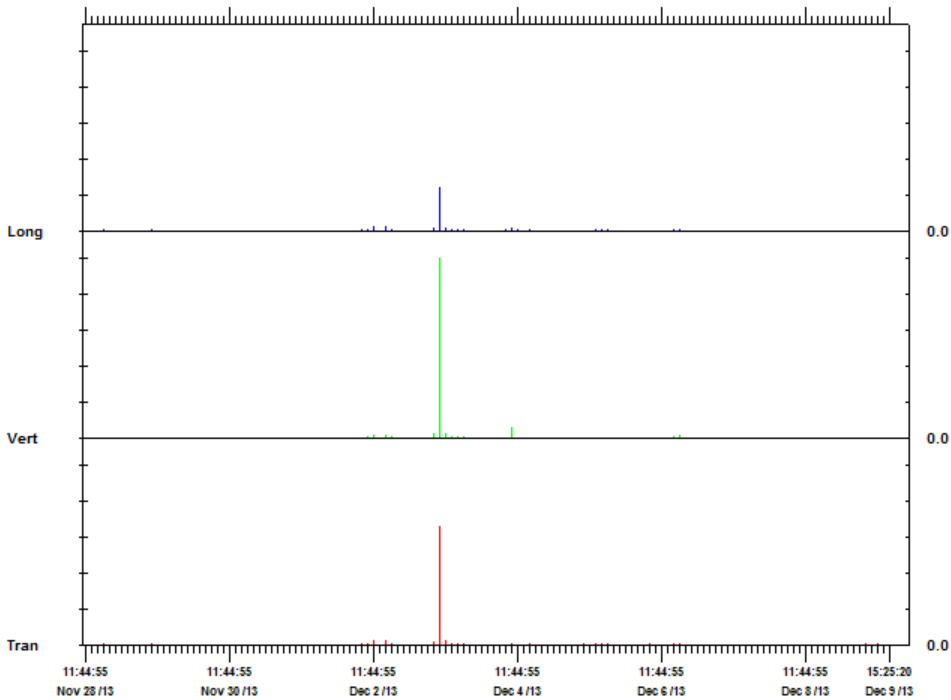
Notes

Post Event Notes

Client: Roadbridge
 Location: The Mortuary Bdg, Grangegorman
 User: Environmental Measurements

	Tran	Vert	Long	
PPV	163	249	59.4	mm/s
ZC Freq	2.3	4.8	3.5	Hz
Date	Dec 3 /13	Dec 3 /13	Dec 3 /13	
Time	09:09:55	09:09:55	09:09:55	
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 290 mm/s on December 3, 2013 at 09:09:55



Time Scale: 2 hours /div Amplitude Scale: Geo: 50.0 mm/s/div
 Printed: December 13, 2013 (V 8.12 - 8.12) Format Copyrighted 2006-2007 Instantel, a division of VeriChip Corporation

3.2.1 Noise : Located at the Mortuary Building, Grangegorman.

Monitoring covers the period from 26 Nov 2013 to 9 Dec 2013.

Date	Time	Duration	Leq	Lmax	Lmin	L(5)	L(10)	L(50)	L(90)
26Nov 13	10:31:46	1693.9	60.7	78.5	48.8	65	63.2	58.8	55.1
26Nov 13	11:00:00	3600	60	72.8	48.3	64.5	62.9	58.4	54.6
26Nov 13	12:00:00	3600	58.1	73.2	41.5	63.1	61.6	55.9	50.1
26Nov 13	13:00:00	3600	56.4	73.1	39.6	62.3	60.5	52.6	43.7
26Nov 13	14:00:00	3600	59	76.4	48.2	64.5	62.6	55.7	51.8
26Nov 13	15:00:00	3600	59.6	80.8	50.1	64	62.6	57.8	53.8
26Nov 13	16:00:00	3600	60.5	85.3	42.6	65.8	63.4	56.6	50.5
26Nov 13	17:00:00	3600	55.2	71.3	43	62.3	59.7	47.5	44.7
26Nov 13	18:00:00	3600	53.2	70.5	42.6	60.7	57.2	45.8	44
26Nov 13	19:00:00	3600	52.6	70.6	41.8	59.3	56	45.5	43.5
26Nov 13	20:00:00	3600	51.9	69.7	40.6	59.1	54	44	42.5
26Nov 13	21:00:00	3600	49.4	67.1	40.1	56.2	51.2	43.2	41.6
26Nov 13	22:00:00	3600	47	67.1	37.1	51.4	46.4	41.4	39.4
26Nov 13	23:00:00	3600	46.1	68.6	35.6	47.2	42.7	39.7	38.2
27Nov 13	00:00:00	3600	43.6	65.5	34.7	42.9	41.3	38.9	37.2
27Nov 13	01:00:00	3600	40.9	62.2	32.6	42.8	40.9	37.6	35.7
27Nov 13	02:00:00	3600	37	61.3	30.9	38.6	37.6	35.1	33.3
27Nov 13	03:00:00	3600	44.4	66.7	30.8	50.7	46.3	36.1	33.9
27Nov 13	04:00:00	3600	42.9	64.7	32.6	47.7	42.8	37.4	34.8
27Nov 13	05:00:00	3600	47	69.5	35.3	52.9	49	41.8	38.7
27Nov 13	06:00:00	3600	51	68.8	40.2	56.8	53.8	45.6	43.1
27Nov 13	07:00:00	3600	57.5	79.3	43.3	63.7	61.5	54	47.2
27Nov 13	08:00:00	3600	60.9	79	49.3	65.6	64.4	59	53.3
27Nov 13	09:00:00	3600	59.6	78.4	41.9	65.1	63.5	56.4	50.1
27Nov 13	10:00:00	3600	56.7	71.9	42.1	62.3	60.6	53.8	45.5
27Nov 13	11:00:00	3600	59.2	76.8	48.9	63.2	61.9	57.7	53.8
27Nov 13	12:00:00	3600	59.1	74.9	44.5	63.5	62	57.6	52.7
27Nov 13	13:00:00	3600	58.5	79.9	41.6	63.5	62.1	57	46.9
27Nov 13	14:00:00	3600	61	73	51.4	65	63.8	59.8	56.8
27Nov 13	15:00:00	3600	60.4	82.2	51.1	64.4	63	59.1	55.4
27Nov 13	16:00:00	3600	67.7	86.1	51.2	76.1	70.6	61.4	56
27Nov 13	17:00:00	3600	56.6	83.2	41.1	62.8	60.7	49.5	42.9
27Nov 13	18:00:00	3600	53.9	69.7	40.7	61.3	58.5	45.4	42.8
27Nov 13	19:00:00	3600	52.3	70.2	40.8	59.4	56	44.8	42.6
27Nov 13	20:00:00	3600	51.4	75.6	39.6	58.3	54.1	43.5	41.5

27Nov 13	21:00:00	3600	50.5	72.6	38.9	56.7	50.3	42.4	40.9
27Nov 13	22:00:00	3600	46.7	67.6	37.9	50.9	45	41.2	39.8
27Nov 13	23:00:00	3600	46.2	70.3	35.9	48.4	43.9	40.4	38.4
28Nov 13	00:00:00	3600	44.6	65.6	34.1	46.4	42.6	39.1	37.2
28Nov 13	01:00:00	3600	37.5	60.4	30.1	39.7	38.7	35.8	33.2
28Nov 13	02:00:00	3600	43.7	69.2	29.8	49.5	45.2	34.9	32.5
28Nov 13	03:00:00	3600	47.7	69.2	30.7	54.7	51.4	36.5	33.2
28Nov 13	04:00:00	3600	44.1	64.6	30.8	50.1	47.3	37.4	34.4
28Nov 13	05:00:00	3600	45.7	67.9	33.3	52.3	49.2	40.4	36.8
28Nov 13	06:00:00	3600	50.5	71.5	37.3	56.3	53.2	44.2	41.1
28Nov 13	07:00:00	3600	62.7	82.3	41.7	67.8	66.5	60.6	45.7
28Nov 13	08:00:00	3600	64.5	85.6	54.2	68.7	67.1	62.7	59
28Nov 13	09:00:00	2126.5	64.3	79.9	53	69	67.8	62.3	58.4
28Nov 13	09:41:11	1128.2	61	79.3	42.5	65.9	64.6	59.1	46
28Nov 13	10:00:00	3600	58.7	72.5	40.9	64.3	62.7	56.3	45.2
28Nov 13	11:00:00	3600	61.6	86.5	48.5	67.4	65.5	58.5	54.1
28Nov 13	12:00:00	3600	61.5	79.9	39.4	66.9	65.4	58.9	52
28Nov 13	13:00:00	3600	57	78.9	37.5	62.4	60.7	54.2	42.8
28Nov 13	14:00:00	3600	61.7	77.5	52.3	66.4	64.1	59.6	56.7
28Nov 13	15:00:00	3600	63.1	79.5	48.5	69.3	66.8	59.2	55.3
28Nov 13	16:00:00	3600	67.3	84.6	47.5	72.2	70.7	65.3	56.6
28Nov 13	17:00:00	3600	55.1	75.4	42.7	62.1	59.9	47.9	44.7
28Nov 13	18:00:00	3600	54.5	73.1	42.6	61.6	59.1	46.4	44.2
28Nov 13	19:00:00	3600	53.5	69.5	42.2	60.8	58	45.6	43.5
28Nov 13	20:00:00	3600	50.5	68	42.1	57.4	52.5	44.2	43.2
28Nov 13	21:00:00	3600	50.4	67	42	57.4	52.3	43.8	43
28Nov 13	22:00:00	3600	50.1	70.9	41.7	55.9	50.7	44	43
28Nov 13	23:00:00	3600	46.5	68.5	41.8	48.6	45.8	43.7	42.7
29Nov 13	00:00:00	3600	46.9	66.1	41.5	50.2	47.2	43.8	42.6
29Nov 13	01:00:00	3600	45.8	69.3	41.3	46.5	44.9	43.2	42.2
29Nov 13	02:00:00	3600	44.2	68.7	40.9	45.5	44.5	42.8	42.1
29Nov 13	03:00:00	3600	45.8	64.6	41	49.9	47.2	43.5	42.2
29Nov 13	04:00:00	3600	46.5	66.7	41.2	49.9	47.9	44	42.5
29Nov 13	05:00:00	3600	46.7	65	41.3	49.4	47.7	45.1	43.5
29Nov 13	06:00:00	3600	53.1	69.7	43.8	60.2	56.3	47.6	45.4
29Nov 13	07:00:00	3600	62.4	79	45.8	68.4	66.9	55.7	49.1
29Nov 13	08:00:00	3600	64.5	82.5	53.3	68.4	67	63.3	59.1
29Nov 13	09:00:00	3600	62.1	86	47.2	66	64.9	60.7	55.4
29Nov 13	10:00:00	3600	60.8	81.1	44.5	66	64.9	58.5	47.1
29Nov 13	11:00:00	3600	67.1	80.5	48.4	75	73.1	60.2	53.9
29Nov 13	12:00:00	3600	63.5	82.4	45.7	68.4	67	61.4	54
29Nov 13	13:00:00	3600	58.6	79	45.4	63.7	62	56.4	48
29Nov 13	14:00:00	3600	60.7	81.6	49.1	65.3	63.8	59	52.8
29Nov 13	15:00:00	3600	59.6	78.6	48.3	65	63.5	56.3	51.2

29Nov 13	16:00:00	3600	58.6	85.8	44.8	63.5	61.4	53.9	49.7
29Nov 13	17:00:00	3600	55.6	71.6	44.7	62.5	60.1	49.5	46.5
29Nov 13	18:00:00	3600	55.1	70.3	45.3	61.9	59.4	49.3	46.8
29Nov 13	19:00:00	3600	53.8	71.7	44.4	60.2	57.1	48.6	46.2
29Nov 13	20:00:00	3600	52.7	73.4	44.9	58.3	54.6	47.8	46.1
29Nov 13	21:00:00	3600	51.3	80.7	44.2	55.8	50.9	46.7	45.3
29Nov 13	22:00:00	3600	49.4	69.8	42.9	54.1	49.6	45.3	44.1
29Nov 13	23:00:00	3600	47.3	68.9	42.4	48.7	46.6	44.5	43.4
30Nov 13	00:00:00	3600	48.2	68	42	50.7	48.4	45.2	43.9
30Nov 13	01:00:00	3600	46.4	67.5	41.7	47.9	46.4	44.4	43.2
30Nov 13	02:00:00	3600	48.2	70.1	41.8	51.1	48.3	44.7	43.3
30Nov 13	03:00:00	3600	48.8	67	41.5	55.7	53.1	43.7	42.4
30Nov 13	04:00:00	3600	48	68.7	41	54.1	51.5	43.5	42.2
30Nov 13	05:00:00	3600	47.7	66.2	41	53.7	51.4	43.4	42.1
30Nov 13	06:00:00	3600	51.9	69.2	41.6	56.9	55.1	45.7	43.4
30Nov 13	07:00:00	3600	51.4	72.1	42.2	57.6	53.7	46	44
30Nov 13	08:00:00	3600	54.2	87.8	43.4	60.3	55.9	46.7	45.1
30Nov 13	09:00:00	3600	56.9	81.8	43.1	62	58	47.1	45.3
30Nov 13	10:00:00	3600	55.8	82.3	41.5	62	59	47	43.9
30Nov 13	11:00:00	3600	53	67.5	40.7	60.2	57.4	46.1	43.2
30Nov 13	12:00:00	3600	53.3	69.2	40.3	60.2	57.2	46.2	43
30Nov 13	13:00:00	3600	54.3	74.2	37.7	61.4	58.6	46	41.2
30Nov 13	14:00:00	3600	53.7	69.7	38.9	61.1	58.3	45.6	41.5
30Nov 13	15:00:00	3600	53.2	70.1	39.8	60.4	57	44.8	42
30Nov 13	16:00:00	3600	52.3	70.2	39.3	59.7	56	43.5	41.4
30Nov 13	17:00:00	3600	51.6	69.1	39.7	58.9	54.3	43.5	41.6
30Nov 13	18:00:00	3600	51	69.7	39.8	58.2	53.6	43.2	41.4
30Nov 13	19:00:00	3600	49.6	68.6	38.7	56.5	51	42.1	40.4
30Nov 13	20:00:00	3600	58.2	71.3	37.6	64.7	63.4	43.1	39.9
30Nov 13	21:00:00	3600	49.3	68.9	37.6	55.9	48.7	40.9	39.2
30Nov 13	22:00:00	3600	47.1	67.6	36.7	50.3	44.5	40	38.3
30Nov 13	23:00:00	3600	47.2	68.6	35.4	50.7	44.5	39.6	37.7
01Dec 13	00:00:00	3600	46.8	67.2	36.1	51.6	46.6	39.5	38
01Dec 13	01:00:00	3600	45.4	68.4	35.8	45.5	41.7	39.4	38
01Dec 13	02:00:00	3600	46.9	67.7	35.9	52.8	49.5	40.2	38.4
01Dec 13	03:00:00	3600	49.9	65.8	35.9	56.7	54.6	41	38.5
01Dec 13	04:00:00	3600	47.7	65.8	34.4	54.8	52.2	39.3	36.8
01Dec 13	05:00:00	3600	52.7	82.5	34.6	55.3	52.6	39	36.8
01Dec 13	06:00:00	3600	49.4	76.3	35.1	54.9	52.2	41.7	38
01Dec 13	07:00:00	3600	52.4	78.6	37.6	56.9	53.1	42.9	40.4
01Dec 13	08:00:00	3600	50.2	71.9	38.1	56.6	52.4	43.4	41.1
01Dec 13	09:00:00	3600	51.7	72.6	39.7	58.2	52.8	43.5	41.5
01Dec 13	10:00:00	3600	54.9	74.8	39.6	62.2	58.6	44.4	41.6
01Dec 13	11:00:00	3600	55.9	73.7	38.1	62.8	60.7	47.2	41.6

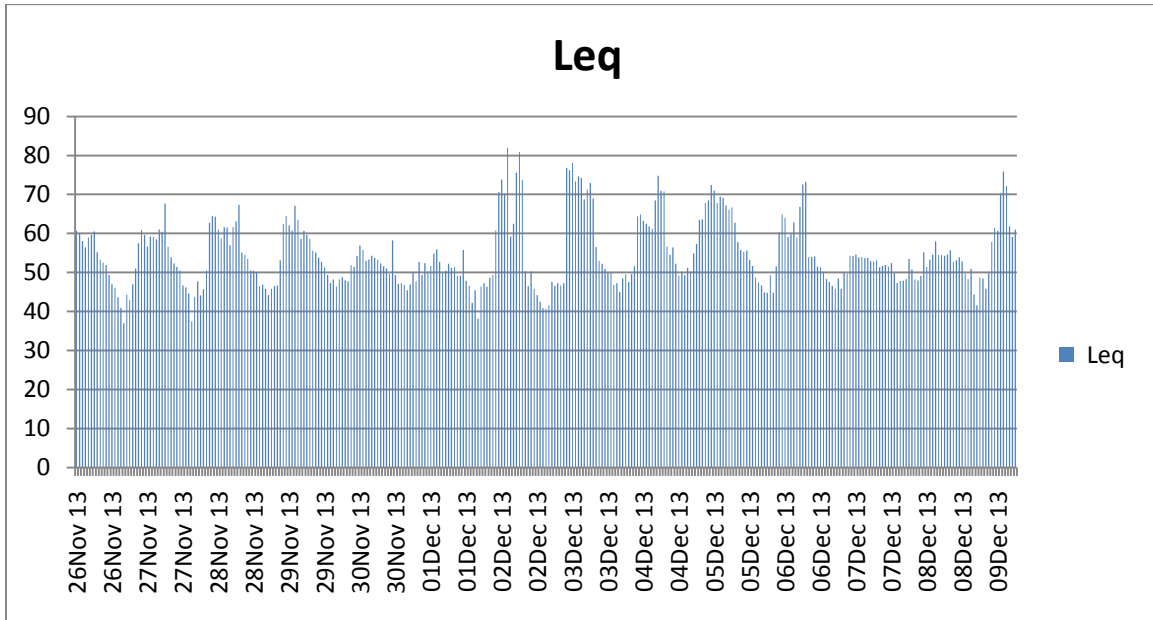
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01Dec 13	13:00:00	3600	49.8	70.9	32.5	56.8	54.2	42.8	37.2
01Dec 13	14:00:00	3600	50.4	71.5	31.6	57.4	54.5	42.2	35.7
01Dec 13	15:00:00	3600	52.2	69.1	31.4	59.4	56.6	42.7	36.2
01Dec 13	16:00:00	3600	51.2	74	30.2	58.8	55.2	38.5	33.3
01Dec 13	17:00:00	3600	51.4	69.9	31	58.7	54.5	38.9	34.4
01Dec 13	18:00:00	3600	49.1	66.7	29	56.6	51	35.4	31.8
01Dec 13	19:00:00	3600	49.1	69.2	28.5	57	51.1	33.9	30.8
01Dec 13	20:00:00	3600	55.8	75.4	27.6	63.3	59	36.5	30.9
01Dec 13	21:00:00	3600	47.9	68.5	27.8	54	47.9	33.8	30.2
01Dec 13	22:00:00	3600	46.6	69.8	27.2	49.2	42.3	33.1	29.6
01Dec 13	23:00:00	3600	42.2	67	30.2	42.5	38.3	34.9	33
02Dec 13	00:00:00	3600	45.4	70	28.7	49.2	42.2	35.2	32
02Dec 13	01:00:00	3600	38.1	66.1	26.5	35.3	34.1	31.1	29
02Dec 13	02:00:00	3600	46.4	60.7	24.4	53.3	51.7	35.4	27.7
02Dec 13	03:00:00	3600	47.2	64.7	25.7	54.4	52.4	32.5	29
02Dec 13	04:00:00	3600	46.3	66.3	25.9	52.8	50.3	34.7	28.3
02Dec 13	05:00:00	3600	48.6	75.4	29.3	55.6	52.9	38.1	33.2
02Dec 13	06:00:00	3600	49.4	69.7	34.1	55.1	52.3	40.1	37.2
02Dec 13	07:00:00	3600	60.8	87.7	36.6	65.4	63.9	58.7	40.3
02Dec 13	08:00:00	3600	70.6	87.4	49.7	78.4	72.7	64.1	58.9
02Dec 13	09:00:00	3600	73.8	101.6	50.7	80.2	71.7	65.3	58.3
02Dec 13	10:00:00	3600	70.2	101.8	35.6	73.2	70.9	60.1	41.6
02Dec 13	11:00:00	3600	81.9	104.7	54.5	89.4	87.7	66	60.4
02Dec 13	12:00:00	3600	59.2	78.3	40.7	63.7	62.4	57	50.6
02Dec 13	13:00:00	3600	62.5	87.1	32.8	67.6	65.7	56.5	37.3
02Dec 13	14:00:00	3600	75.6	88.5	55.1	80.8	80.3	72.7	63.4
02Dec 13	15:00:00	3600	80.9	93.8	57.6	86.8	86	77.6	67.5
02Dec 13	16:00:00	3600	73.7	105	46.2	79.8	77.5	68.2	58.7
02Dec 13	17:00:00	3600	50.3	69.1	38.6	56	54.2	46.5	39.7
02Dec 13	18:00:00	3600	46.5	67	38	52.6	49.9	40.6	39.1
02Dec 13	19:00:00	3600	50.3	74.6	38.3	54.9	52.1	41	39.3
02Dec 13	20:00:00	3600	45.8	72.1	38.7	51.8	48.5	40.9	39.6
02Dec 13	21:00:00	3600	44.2	64.8	38	49.8	45.6	40.6	39.3
02Dec 13	22:00:00	3600	42.5	59.9	38.3	45.9	42	39.8	39.1
02Dec 13	23:00:00	3600	40.8	58.9	37.7	41.7	40.8	39.6	38.8
03Dec 13	00:00:00	3600	40.7	61.9	37.9	41.9	40.7	39.5	38.5
03Dec 13	01:00:00	3600	41.6	66.8	37.4	40	39.9	39.1	38.2
03Dec 13	02:00:00	3600	47.6	63.6	36.3	54.7	52.4	39.3	37.5
03Dec 13	03:00:00	3600	46.6	64.3	36	53.9	51.3	38.4	37.1
03Dec 13	04:00:00	3600	47.2	64.7	36.4	53.9	51.9	39.3	37.4
03Dec 13	05:00:00	3600	46.7	69.9	36.6	53.1	51.1	39.8	38.1
03Dec 13	06:00:00	3600	47.2	65.5	38	53	51.2	42.8	40.2
03Dec 13	07:00:00	3600	76.8	104.8	40.3	81.9	80.9	68.8	42.8

03Dec 13	08:00:00	3600	76.2	100.8	61.4	81.7	80.6	69	65.1
03Dec 13	09:00:00	3600	78.1	105	59	81.7	79.4	74.4	68.8
03Dec 13	10:00:00	3600	73.3	98.2	43.1	76.8	73.4	53.2	45.3
03Dec 13	11:00:00	3600	74.6	102.2	59.3	77.3	75.9	70.7	66.4
03Dec 13	12:00:00	3600	74.2	95	49.4	78.1	76.5	71.1	65.6
03Dec 13	13:00:00	3600	68.7	87.2	42.7	74.3	73.1	63.9	46.4
03Dec 13	14:00:00	3600	71.3	88.4	56.4	76.5	74.7	68.1	60.9
03Dec 13	15:00:00	3600	72.9	90	54.6	77.7	76.7	70.6	62.8
03Dec 13	16:00:00	3600	69	87.1	55.6	73.4	72.1	67.3	61.2
03Dec 13	17:00:00	3600	56.5	76.7	43.7	63.1	60.4	48	44.8
03Dec 13	18:00:00	3600	53	72.2	43.7	60.1	57.1	46	44.4
03Dec 13	19:00:00	3600	52.2	67.2	43.9	59.1	55.8	46.6	45.1
03Dec 13	20:00:00	3600	50.9	69	43.4	56.9	53.2	45.9	44.5
03Dec 13	21:00:00	3600	49.9	67.6	43.5	55.9	52.2	45.8	44.4
03Dec 13	22:00:00	3600	49.9	71.1	42.5	55.2	52	45.6	44
03Dec 13	23:00:00	3600	46.8	68.1	41.3	50	47.9	44.3	42.7
04Dec 13	00:00:00	3600	47.2	67.7	41.1	48.7	45.6	43	42.1
04Dec 13	01:00:00	3600	45	66.2	40.6	44.4	43.6	42.4	41.4
04Dec 13	02:00:00	3600	48.5	70.3	39.9	55.4	52.7	42.4	41.3
04Dec 13	03:00:00	3600	49.5	66.9	40.3	56	54.1	42.9	41.4
04Dec 13	04:00:00	3600	47.6	65.3	40.3	54.3	51.8	42.4	41.3
04Dec 13	05:00:00	3600	49.6	68.7	40.6	55.8	53.8	44.1	42.1
04Dec 13	06:00:00	3600	51.6	69.3	42.1	56.9	54.8	46.7	44.4
04Dec 13	07:00:00	3600	64.4	87.6	45.6	70.1	68	60.7	48.3
04Dec 13	08:00:00	3600	64.9	86.4	51.1	68.7	66.9	61.8	57.4
04Dec 13	09:00:00	3600	63.2	82	46.1	67.9	66.3	61.4	56.4
04Dec 13	10:00:00	3600	62.5	79.9	44.6	67.4	66.6	60	47.2
04Dec 13	11:00:00	3600	61.8	79.4	48.3	66.5	64.3	59.8	56.2
04Dec 13	12:00:00	3600	61.3	81.2	52.5	65	63.8	60.2	56.3
04Dec 13	13:00:00	3600	68.5	87.5	45.7	75.2	73.7	57.1	52.1
04Dec 13	14:00:00	3600	74.8	90.1	59.7	80.1	79	72	66
04Dec 13	15:00:00	3600	70.9	92.5	55.5	76.6	74.3	68.5	60.7
04Dec 13	16:00:00	3600	70.8	94.3	50	72.7	71.5	68.9	61.5
04Dec 13	17:00:00	3600	56.7	76.5	46.2	63	60.8	51.7	47.9
04Dec 13	18:00:00	3600	54.5	72	45.6	61.2	58	48.6	46.9
04Dec 13	19:00:00	3600	56.4	90.5	44.5	61.7	58.4	48	46.1
04Dec 13	20:00:00	3600	52.2	69.2	43.9	58.6	54.6	46.7	45.2
04Dec 13	21:00:00	3600	49.2	66.4	43.8	53.2	49.7	45.8	44.8
04Dec 13	22:00:00	3600	50.2	68.1	43.8	55.1	51.7	46.1	44.8
04Dec 13	23:00:00	3600	49.4	69.1	43.5	54.4	51.4	45.7	44.3
05Dec 13	00:00:00	3600	51.2	77.5	43.5	56.4	52.4	45.8	44.4
05Dec 13	01:00:00	3600	50.3	73.4	42.6	55.4	52.3	45.9	44.3
05Dec 13	02:00:00	3600	54.9	78.5	43.4	60.7	57.2	48.2	45.3
05Dec 13	03:00:00	3600	57.3	85.5	44	62.9	59.3	49.6	46.1

05Dec 13	04:00:00	3600	63.5	91.5	45	68.8	64.7	53.4	47.8
05Dec 13	05:00:00	3600	63.6	89.1	46.7	69.3	65.8	55.1	49.9
05Dec 13	06:00:00	3600	67.8	92.5	48.2	73.2	69.3	57.4	52.1
05Dec 13	07:00:00	3600	68.5	89.2	48.8	73.7	71.8	64.3	54.9
05Dec 13	08:00:00	3600	72.4	92.3	58.3	77	74.8	70.2	66.4
05Dec 13	09:00:00	3600	71	93	52	74.9	73.4	69.6	60.9
05Dec 13	10:00:00	3600	67.8	89.5	49.4	72.6	71.2	64.7	55.9
05Dec 13	11:00:00	3600	69.5	89.6	55.4	73.5	72	68.3	61.9
05Dec 13	12:00:00	3600	69.1	86.2	48.6	72.8	71.8	68.3	61.6
05Dec 13	13:00:00	3600	67.2	88.3	45.1	72.4	71.2	63	49.6
05Dec 13	14:00:00	3600	66	85.1	52.9	70.8	69.5	62.6	57.1
05Dec 13	15:00:00	3600	66.7	95.9	53.1	69.5	67.1	60.7	57.4
05Dec 13	16:00:00	3600	62.7	88.6	48	66.7	65.3	60	55.5
05Dec 13	17:00:00	3600	57.8	73.5	45.7	64.2	62.4	52.6	48
05Dec 13	18:00:00	3600	55.8	70	45.4	62.7	60.5	49.3	46.8
05Dec 13	19:00:00	3600	55.3	70.9	44.5	62.3	59.8	48.4	46.2
05Dec 13	20:00:00	3600	55.6	74.9	43.6	62.3	59.3	47.6	45.2
05Dec 13	21:00:00	3600	53.2	71.2	43.2	60.1	55.7	46.4	44.8
05Dec 13	22:00:00	3600	51.7	69.1	43.2	58.5	52.9	45.8	44.4
05Dec 13	23:00:00	3600	48.7	68.9	42.1	51.1	47.7	44.6	43.3
06Dec 13	00:00:00	3600	47.4	67.7	41.6	49.4	46	43.6	42.5
06Dec 13	01:00:00	3600	46.7	68.7	41.1	47.7	45.5	43.4	42.3
06Dec 13	02:00:00	3600	44.9	64.3	40.6	45.9	44.6	42.8	41.9
06Dec 13	03:00:00	3600	44.8	66.7	40.1	45.4	44	42.4	41.3
06Dec 13	04:00:00	3600	49.3	68.6	40.4	55.7	53.8	43.5	41.8
06Dec 13	05:00:00	3600	44.8	67.7	40.3	44.8	44	42.9	42
06Dec 13	06:00:00	3600	51.5	71.3	41.7	57.9	54.6	45.3	43.4
06Dec 13	07:00:00	3600	60.3	80.5	44	66.2	64.6	56.7	46.1
06Dec 13	08:00:00	3600	64.9	85.9	49.2	68.4	66.3	60.5	55.3
06Dec 13	09:00:00	3600	64	81.7	48.7	69.3	67.7	61.5	55.3
06Dec 13	10:00:00	3600	59.1	81.8	45	64.9	62.5	54.8	47.6
06Dec 13	11:00:00	3600	59.8	81.2	48.4	65.2	63.4	56.9	52
06Dec 13	12:00:00	3600	62.9	82.1	51.1	66.6	64.6	60.2	56.3
06Dec 13	13:00:00	3600	59	75.1	45.6	64.1	62.4	56.4	51.1
06Dec 13	14:00:00	3600	66.8	93.1	46.7	69.7	67.8	58.3	51.2
06Dec 13	15:00:00	3600	72.6	96.1	47.9	78.9	75.8	61.5	53.4
06Dec 13	16:00:00	3600	73.2	94.8	44.1	80.8	78.9	59.2	46.5
06Dec 13	17:00:00	3600	54	68.6	43.8	61	58.5	47.1	45.2
06Dec 13	18:00:00	3600	54	79.9	44.2	60.7	57.6	47	45.4
06Dec 13	19:00:00	3600	54.1	72.7	44.3	61.2	57.9	46.8	45.3
06Dec 13	20:00:00	3600	51.5	70.7	43.4	58.4	53.6	45.9	44.6
06Dec 13	21:00:00	3600	51.3	68.8	42.7	57.7	52.5	45.2	44.1
06Dec 13	22:00:00	3600	50.2	70.3	42.4	55.2	50.2	44.7	43.5
06Dec 13	23:00:00	3600	48.3	66.3	42.2	51.5	48	44.5	43.3

07Dec 13	00:00:00	3600	47.6	67.3	42.3	50.4	47.1	44.1	43.2
07Dec 13	01:00:00	3600	46.6	67.9	42.1	48.4	46	43.8	43.1
07Dec 13	02:00:00	3600	45.8	69.2	41.9	46.1	44.9	43.6	42.8
07Dec 13	03:00:00	3600	48.5	69.1	41.8	51.6	48.1	44.1	43.1
07Dec 13	04:00:00	3600	45.8	66.6	41.8	47.3	45.6	43.6	42.7
07Dec 13	05:00:00	3600	50	72.9	41	55.9	52.3	43.4	42.2
07Dec 13	06:00:00	3600	49.7	66.9	41.3	55.7	53.3	44.2	42.9
07Dec 13	07:00:00	3600	54.3	73	42.4	61.8	57.9	44.9	43.4
07Dec 13	08:00:00	3600	54.2	79	42.8	60.8	57.3	45.7	44.1
07Dec 13	09:00:00	3600	54.6	73.2	43.2	61.9	58.2	46.2	44.3
07Dec 13	10:00:00	3600	53.9	69.7	43.9	60.4	57.9	47.6	45.1
07Dec 13	11:00:00	3600	54	70.2	43.3	61	57.8	47.3	44.5
07Dec 13	12:00:00	3600	53.7	75.9	42.9	60.4	57.2	46.6	44.4
07Dec 13	13:00:00	3600	53.7	69.5	43.3	60.8	58	46.6	44.3
07Dec 13	14:00:00	3600	52.9	71.1	43.2	59.8	56.8	45.8	44.2
07Dec 13	15:00:00	3600	52.8	68.7	42.8	59.6	56.8	45.9	44.1
07Dec 13	16:00:00	3600	53.1	72.2	43	60.2	56.8	45.8	44.1
07Dec 13	17:00:00	3600	51.3	75.7	43.3	57.9	52.9	44.9	44.1
07Dec 13	18:00:00	3600	51.7	71.9	43.1	58.2	54.1	45.2	44.1
07Dec 13	19:00:00	3600	51.9	69.6	43.2	58.6	54.1	45.7	44.3
07Dec 13	20:00:00	3600	51.5	72.4	42.8	58	53.6	45.3	44.1
07Dec 13	21:00:00	3600	52.4	73.5	42.5	59.6	56.3	46	44
07Dec 13	22:00:00	3600	49.8	71	41.6	55.5	50.8	44.3	43.1
07Dec 13	23:00:00	3600	47.3	67.6	41.8	49.5	46.3	43.6	42.7
08Dec 13	00:00:00	3600	47.8	68.4	41.5	51.8	48	43.7	42.8
08Dec 13	01:00:00	3600	47.9	67.8	41.8	50.6	46.3	43.6	42.9
08Dec 13	02:00:00	3600	48.3	70.2	42.2	52	48.4	44.4	43.2
08Dec 13	03:00:00	3600	53.5	73.2	42.1	59.3	53.7	44.8	43.4
08Dec 13	04:00:00	3600	50.8	70.2	42.2	56.8	54.9	45.8	43.4
08Dec 13	05:00:00	3600	48.2	67.6	41.6	53.8	51.2	44.5	43
08Dec 13	06:00:00	3600	48	67.6	41.6	51.9	48.7	43.9	42.7
08Dec 13	07:00:00	3600	49.1	71.6	42.1	53.3	49.6	44.7	43.3
08Dec 13	08:00:00	3600	55.2	76.7	42.2	61.5	57.2	45.2	43.4
08Dec 13	09:00:00	3600	51.4	72.8	41	56.6	52.7	45.5	43.6
08Dec 13	10:00:00	3600	53.3	76.1	40.5	59.9	56.5	46.5	42.9
08Dec 13	11:00:00	3600	54.5	77.5	41.1	60.9	58.2	48.4	44
08Dec 13	12:00:00	3600	58	82	42.6	64.2	61.4	51	45.4
08Dec 13	13:00:00	3600	54.5	78.1	41.5	60.7	58	48	43.8
08Dec 13	14:00:00	3600	54.5	74.5	41.7	61.4	58.4	47.7	44
08Dec 13	15:00:00	3600	54.3	75.9	42.1	60.7	58.2	48.7	44.4
08Dec 13	16:00:00	3600	54.6	78.5	41.7	60.3	57.9	49.1	44.6
08Dec 13	17:00:00	3600	55.7	80.3	41.8	61.4	58.8	48.7	44.2
08Dec 13	18:00:00	3600	52.7	75.4	41.9	59	55.8	47.1	43.9
08Dec 13	19:00:00	3600	53.1	73.3	40	59.6	56.4	46.7	43

08Dec 13	20:00:00	3600	53.9	77.7	40.3	60.3	57.4	47.4	43.1
08Dec 13	21:00:00	3600	52.8	75.4	39.3	58.9	56.1	46.3	42.5
08Dec 13	22:00:00	3600	49.8	72.2	38.4	55.5	52.3	43.4	40.5
08Dec 13	23:00:00	3600	48.3	77.9	36.6	52.8	48.8	41.1	39.1
09Dec 13	00:00:00	3600	50.9	75.2	36.8	56.8	53.5	44.7	40.1
09Dec 13	01:00:00	3600	44.4	67	32.3	47.6	43.7	37	34.5
09Dec 13	02:00:00	3600	41.6	62.4	30.1	42.6	38.5	34.5	32.6
09Dec 13	03:00:00	3600	48.7	65.8	29.1	56.2	54.1	35.1	32.2
09Dec 13	04:00:00	3600	48.5	65	30.9	55.5	53.4	37.4	33.8
09Dec 13	05:00:00	3600	45.8	67.8	32.5	52.8	49.2	37.7	35.7
09Dec 13	06:00:00	3600	49.8	67.8	35.8	57.1	53.7	41.3	38.9
09Dec 13	07:00:00	3600	57.8	80.6	39.7	63.8	61.8	52.4	42.7
09Dec 13	08:00:00	3600	61.4	78.7	45.4	66.3	64.9	59.1	52.1
09Dec 13	09:00:00	3600	60.7	74.9	45.4	66.8	64.9	57	51.1
09Dec 13	10:00:00	3600	70.3	82.2	39.1	77.8	76.6	57.7	43.8
09Dec 13	11:00:00	3600	75.9	86.6	43.9	81.2	80.2	73.5	52.8
09Dec 13	12:00:00	3600	72.2	84.6	43	79.2	77.9	59.5	50.9
09Dec 13	13:00:00	3600	61.8	82	43.1	67.9	64.6	57.7	48.3
09Dec 13	14:00:00	3600	59.1	83.1	50.1	63.8	62.3	56.8	53.6
09Dec 13	15:00:00	1685.5	61	77.6	47.5	66.6	64.9	57.6	52.7



**Report Noise and Vibration Stn.3 Church of Ireland Building
Grangegorman**

for Roadbridge

Project: Site Infrastructure & Public Realm Works

Monitoring Period: 25 Nov 2013 to 9 Dec 2013

Revision	Prepared By	Date	Approved	Date
01	K. O'Brien	9 Dec 2013	MH	10 Dec 2013

Report prepared by: Kevin O'Brien MIEI
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1. Introduction

At the request of Roadbridge, our company Environmental Measurements has carried out noise and vibration monitoring at the Church of Ireland Building, Grangeegorman, Dublin.

The purpose of the survey was to:

1. Measure the noise and vibration levels impacting on the Church Building while Roadbridge carried out works as part of the Grangeegorman redevelopment.

2. Methodology

2.1 Vibration

One InstanTel Model MiniMate Plus vibration monitor was installed at the Church Building.

This monitor is a triaxial velocity meter which measures peak particle velocity (ppv) in mm/sec together with the frequency at peak. This allows for the calculation of acceleration and displacement at peak.

A specification sheet for the InstanTel Model Mini Mate Plus accompanies this report.

2.2 Noise

One Larson Davis Model 812 noise monitor was installed at the Church Building.

This monitor is an integrating sound level meter which measures the standard sound level parameters of Leq, Max, Min, Pk, UnwPk and Lns.

A specification sheet for the Larson Davis Model 812 accompanies this report.

3. Results

3.1.1 Vibration : Located at the Church Building, Grangegorman.

Monitoring covers the period from 25 Nov 2013 to 9 Dec 2013. A Peak Particle Velocity (PPV) of 16.4mm/sec was recorded during this monitoring run.

Please note that the monitor took an impact during this monitoring period. As a result it would not be reliable to use this data.



Event Report

Histogram Start Time	16:10:36 November 25, 2013	Serial Number	BE8875 V 10.52-8.17 MiniMate Plus
Histogram Finish Time	09:48:33 November 28, 2013	Battery Level	6.8 Volts
Number of Intervals	787 at 5 minutes	Calibration	April 13, 2013 by Instantel
Range	Geo :254 mm/s	File Name	J875F2ZJ.L00
Sample Rate	1024sps		

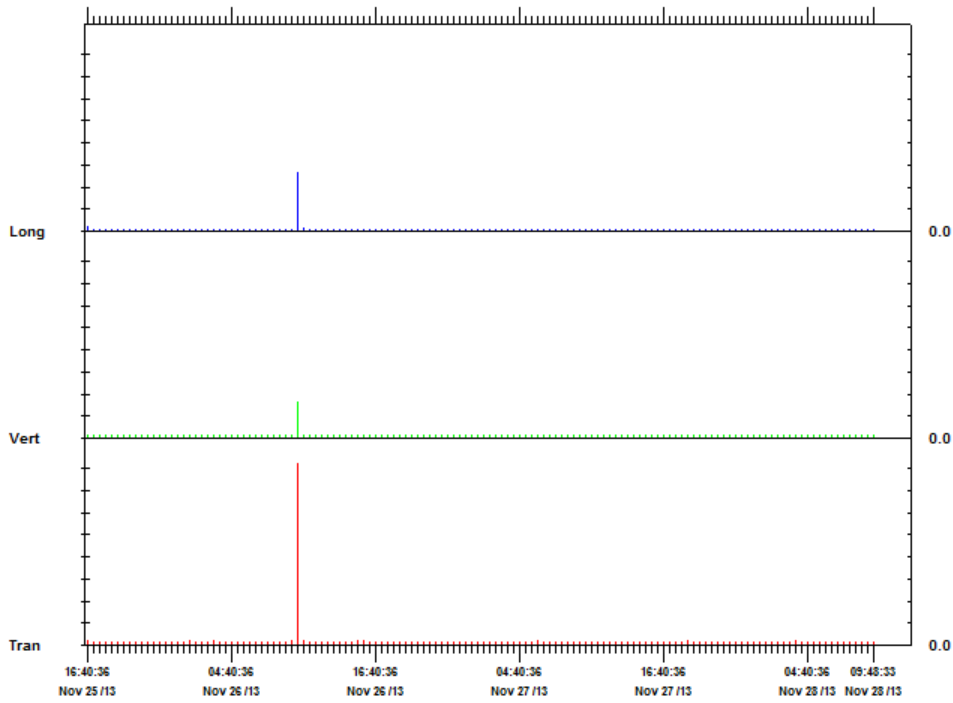
Notes

Post Event Notes

Client: Roadbridge
 Location: Church, Grangegorman
 User: Environmental Measurements

	Tran	Vert	Long	
PPV	16.4	3.30	5.33	mm/s
ZC Freq	4.0	3.1	3.2	Hz
Date	Nov 26 /13	Nov 26 /13	Nov 26 /13	
Time	10:05:36	10:05:36	10:05:36	
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 17.2 mm/s on November 26, 2013 at 10:05:36



Time Scale: 30 minutes /div Amplitude Scale: Geo: 2.00 mm/s/div



Event Report

Histogram Start Time	09:59:04 November 28, 2013	Serial Number	BE8875 V 10.52-8.17 MiniMate Plus
Histogram Finish Time	15:43:24 December 9, 2013	Battery Level	6.8 Volts
Number of Intervals	3236 at 5 minutes	Calibration	April 13, 2013 by Instantel
Range	Geo :254 mm/s	File Name	J875F34M.EG0
Sample Rate	1024sps		

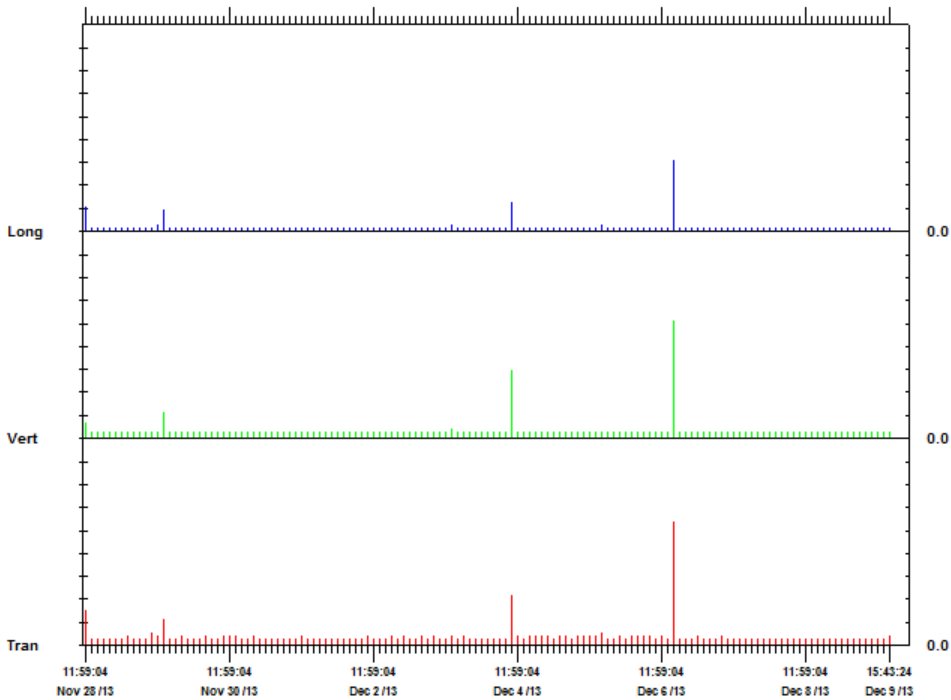
Notes

Post Event Notes

Client: Roadbridge
 Location: Church, Grangegorman
 User: Environmental Measurements

	Tran	Vert	Long	
PPV	5.33	5.08	3.05	mm/s
ZC Freq	30	32	34	Hz
Date	Dec 6 /13	Dec 6 /13	Dec 6 /13	
Time	15:29:04	15:29:04	15:29:04	
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 6.22 mm/s on December 6, 2013 at 15:29:04



Time Scale: 2 hours /div Amplitude Scale: Geo: 1.000 mm/s/div
 Printed: December 13, 2013 (V 8.12 - 8.12) Format Copyrighted 2006-2007 Instantel, a division of VeriChip Corporation

3.2.1 Noise : Located at the Church Building, Grangegorman.

Monitoring covers the period from 25 Nov 2013 to 9 Dec 2013.

Date	Time	Duration	Leq	Lmax	Lmin	L(5)	L(10)	L(50)	L(90)
25Nov 13	16:13:04	2815	53.7	78.3	41.6	57.7	56.4	52	47.1
25Nov 13	17:00:00	3600	47.6	67.1	38.6	53.3	51.5	43.7	40.3
25Nov 13	18:00:00	3600	45.8	65	37	51.9	49.8	41.4	39
25Nov 13	19:00:00	3600	46.4	65.9	37.1	52.1	50	40.7	38.5
25Nov 13	20:00:00	3600	44.3	63.5	36.4	50.3	47.8	39.6	37.9
25Nov 13	21:00:00	3600	44.7	67.1	36.1	50.6	48	39.7	38.2
25Nov 13	22:00:00	3600	42.1	64.9	35.6	46.8	42.1	38.4	37.1
25Nov 13	23:00:00	3600	40.6	64.1	34	42.4	39.5	37.2	35.8
26Nov 13	00:00:00	3600	39.7	63.9	33.3	41.6	38.5	36.2	35
26Nov 13	01:00:00	3600	38.8	61.5	32.2	38.9	37	35.4	34
26Nov 13	02:00:00	3600	36	63.8	31.4	36.8	35.8	34.4	33.1
26Nov 13	03:00:00	3600	34.2	62.3	30.2	34.9	34.7	33.1	31.6
26Nov 13	04:00:00	3600	39.1	62	30.2	39.3	36.7	34.1	32.4
26Nov 13	05:00:00	3600	39.8	62.7	32.1	39.8	38.7	36.7	34.6
26Nov 13	06:00:00	3600	46.3	68.3	35.3	51.5	48.3	41.2	38.4
26Nov 13	07:00:00	3600	50.8	69.2	39.3	55.8	54.1	47.2	41.4
26Nov 13	08:00:00	3600	54.6	75.1	46.1	57.9	56.8	53.3	50.2
26Nov 13	09:00:00	3600	63.2	88	44.8	66.8	62.4	54.1	49.6
26Nov 13	10:00:00	3600	56.4	85.6	39.1	58.9	56.3	47.7	41.6
26Nov 13	11:00:00	3600	55	73	42.3	60.2	57.1	51.8	48.2
26Nov 13	12:00:00	3600	54	73.7	41.3	57.9	55.9	51.7	48.3
26Nov 13	13:00:00	3600	49	69.2	38.4	54	52.6	46.5	41.2
26Nov 13	14:00:00	3600	54.3	76.1	44.4	57.9	56.4	52	48.4
26Nov 13	15:00:00	3600	55.4	73.8	43.8	60.7	58.5	52.3	48.1
26Nov 13	16:00:00	3600	51.9	69.2	41.9	56.3	54.9	50.1	46.7
26Nov 13	17:00:00	3600	48.8	70	40.5	53.6	51.9	45.3	42.4
26Nov 13	18:00:00	3600	47.2	65.8	39.9	52.2	50.3	43.5	41.8
26Nov 13	19:00:00	3600	45.9	60.9	39.9	51.3	49.3	42.9	41.3
26Nov 13	20:00:00	3600	45.9	62.2	38.7	52.2	49.4	41.7	40.2
26Nov 13	21:00:00	3600	44	63.5	38	49.7	46.7	41.1	39.8
26Nov 13	22:00:00	3600	42.7	63.4	36.1	47.3	43.1	39.4	38
26Nov 13	23:00:00	3600	41.3	62	35.6	43.8	40.7	38.3	37.2
27Nov 13	00:00:00	3600	41	69.3	35	43.1	40.8	38.3	36.8
27Nov 13	01:00:00	3600	38.2	58.5	32.6	40	38.7	36.3	34.7
27Nov 13	02:00:00	3600	35.6	58.4	32.1	37.3	36.6	34.9	33.5
27Nov 13	03:00:00	3600	36.5	59.1	30.3	38	36.8	34.3	32.4

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27Nov 13	04:00:00	3600	38	62.1	31	39	38	35.6	33.5
27Nov 13	05:00:00	3600	40.6	64.1	34	42	41.1	39	36.6
27Nov 13	06:00:00	3600	46.4	62.6	38.1	52.4	48.4	42	40.2
27Nov 13	07:00:00	3600	52.5	76.3	40.7	56.5	54.4	47.5	42.9
27Nov 13	08:00:00	3600	53.6	79.6	44.1	56.7	55.4	51.4	48
27Nov 13	09:00:00	3600	53.9	78.9	41.1	57.9	56.1	50.9	46.3
27Nov 13	10:00:00	3600	50.3	65.5	38.5	55.5	54.1	48.2	40.9
27Nov 13	11:00:00	3600	51.2	67.9	40.5	55.9	54.2	49.3	45.7
27Nov 13	12:00:00	3600	50.4	64.5	40.1	54.7	53.4	48.7	45.1
27Nov 13	13:00:00	3600	49	65.4	37.7	53.7	52.4	47	41
27Nov 13	14:00:00	3600	50.7	65.2	43.9	54.4	53.3	49.6	46.8
27Nov 13	15:00:00	3600	51	69.3	43.9	54.6	53.5	50	47.3
27Nov 13	16:00:00	3600	51	64.9	42.7	55	53.9	49.8	46.2
27Nov 13	17:00:00	3600	47.6	69.3	37.9	53.2	51.7	43.6	40
27Nov 13	18:00:00	3600	46.5	60.5	38.2	52.4	50.7	42.5	40.1
27Nov 13	19:00:00	3600	45	60.9	38	50.6	48.7	41.9	39.9
27Nov 13	20:00:00	3600	45.4	63	37.8	51.5	49	40.9	39.2
27Nov 13	21:00:00	3600	44	59.8	37.3	50	46.8	40.1	38.9
27Nov 13	22:00:00	3600	42.3	61.2	36.4	47.3	43.3	39.3	38.1
27Nov 13	23:00:00	3600	41.2	59.7	34.4	44.9	40.9	38.2	36.8
28Nov 13	00:00:00	3600	40.5	62.9	33.7	43.8	40.4	37	35.5
28Nov 13	01:00:00	3600	35.9	59.7	31.9	37.6	36.7	34.7	33.3
28Nov 13	02:00:00	3600	36.6	59.3	31.4	37.6	36	34.3	33.1
28Nov 13	03:00:00	3600	36	60.2	29.8	37	35.9	33.8	32
28Nov 13	04:00:00	3600	36.5	60.2	29.6	38.8	37	33.8	32.1
28Nov 13	05:00:00	3600	38.4	60.8	32.3	41	39.7	37.1	34.7
28Nov 13	06:00:00	3600	44.2	61.7	35	50.4	47	40.3	38.2
28Nov 13	07:00:00	3600	50	71.5	38.9	55.3	53.9	46.5	41.1
28Nov 13	08:00:00	3600	52	72.5	43.7	55.9	54.6	50.7	47.4
28Nov 13	09:00:00	3600	53.2	82	38.7	55.5	54.3	49.2	44.7
28Nov 13	10:00:00	223.4	49.2	65.4	38	55.2	52.8	43.9	40.2
28Nov 13	10:12:05	2874	49.9	66.9	37.3	54.7	53.3	47.9	42
28Nov 13	11:00:00	3600	52.1	66.3	41.1	56.6	55.4	50	46
28Nov 13	12:00:00	3600	51.6	77.6	35	56.2	54.7	49.6	45.7
28Nov 13	13:00:00	3600	49.4	70.2	35.9	54.2	52.8	47.3	39.4
28Nov 13	14:00:00	3600	51.1	65.1	43.5	54.8	53.6	49.9	46.6
28Nov 13	15:00:00	3600	51.2	67.3	42.2	55	54	50.2	46.7
28Nov 13	16:00:00	3600	51.7	68.1	41.3	55.7	54.5	50.4	46.9
28Nov 13	17:00:00	3600	47.6	61.4	38	53.4	51.9	43.8	39.7
28Nov 13	18:00:00	3600	46.7	59.6	37.8	52.7	50.9	42.3	39.4
28Nov 13	19:00:00	3600	47.5	66.7	37.3	52.9	50.8	41.8	38.9
28Nov 13	20:00:00	3600	45.5	64.8	37.2	51.6	49	40.1	38.6
28Nov 13	21:00:00	3600	44.7	62.9	37	50.5	48.1	40	38.7
28Nov 13	22:00:00	3600	44.5	62.3	37.2	50.4	47.2	40.4	39

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28Nov 13	23:00:00	3600	43.2	61.3	37.6	47.3	44.9	41	39.3
29Nov 13	00:00:00	3600	43	61.3	36.2	47.9	45.6	40.6	38.7
29Nov 13	01:00:00	3600	40.8	60.2	36	43.5	41.7	39.1	37.6
29Nov 13	02:00:00	3600	40	58	35.5	42.6	41.6	39.1	37.5
29Nov 13	03:00:00	3600	41.6	60.4	35.3	45.6	43.7	40.1	38
29Nov 13	04:00:00	3600	43.7	60.9	35.7	48.7	47	41.4	38.3
29Nov 13	05:00:00	3600	43.9	67.6	36.8	48.2	46.9	41.9	39.2
29Nov 13	06:00:00	3600	46.7	61.8	39.9	50.9	49.4	45.1	42.4
29Nov 13	07:00:00	3600	52.3	71.3	43.4	56.2	55	50.5	46.6
29Nov 13	08:00:00	3600	54	83.4	45.5	56.5	55.4	52.4	49.8
29Nov 13	09:00:00	3600	61.4	87.5	45.7	66.6	64.2	54	49.5
29Nov 13	10:00:00	3600	64.7	92.5	40.9	68.9	67.7	53.2	43.9
29Nov 13	11:00:00	3600	62.7	92	43.5	66.9	65.1	53.5	47.7
29Nov 13	12:00:00	3600	65.6	87.8	41.1	68.7	63	52.8	48.1
29Nov 13	13:00:00	3600	50.2	61.5	41.8	54.7	53.5	48.7	44.5
29Nov 13	14:00:00	3600	51.3	70	44.4	54.6	53.6	50.4	48.2
29Nov 13	15:00:00	3600	51.3	69.6	44.8	55.1	53.9	49.9	47.2
29Nov 13	16:00:00	3600	51.3	74.5	41.1	56.3	54.6	48.5	44.8
29Nov 13	17:00:00	3600	47.9	65.1	40.4	53.1	51.6	45.2	42.3
29Nov 13	18:00:00	3600	48	63.7	40.9	52.9	51.5	45.4	43
29Nov 13	19:00:00	3600	47.5	66.9	40.2	51.9	50.1	44.7	42.1
29Nov 13	20:00:00	3600	46.7	66.2	40.6	51.6	49.5	43.9	42.2
29Nov 13	21:00:00	3600	45.2	63.3	39.6	49.8	47.4	42.6	41.2
29Nov 13	22:00:00	3600	43.9	67	38.7	48.8	46	41.4	40.1
29Nov 13	23:00:00	3600	42.8	66.7	38.6	45.3	43	40.9	39.9
30Nov 13	00:00:00	3600	43.5	64.7	37.6	47.1	44	41.1	39.9
30Nov 13	01:00:00	3600	41.1	57.6	37.4	43.3	41.8	40	38.8
30Nov 13	02:00:00	3600	42.8	62.8	37.4	46.1	42.7	40.3	39.1
30Nov 13	03:00:00	3600	41	62.4	38	42.3	41.9	40.6	39.4
30Nov 13	04:00:00	3600	41.3	62.4	37.5	42.6	41.8	40.3	39.2
30Nov 13	05:00:00	3600	40.9	63.3	36.5	42	41.4	39.8	38.6
30Nov 13	06:00:00	3600	43.7	64.3	37.9	48	44.5	41.4	40
30Nov 13	07:00:00	3600	46.3	63.9	39.5	51.9	49.8	43.4	41.4
30Nov 13	08:00:00	3600	48.5	77.6	41	53.1	51.1	44.5	42.5
30Nov 13	09:00:00	3600	47.9	73.9	41.5	52.9	50.8	44.8	43.2
30Nov 13	10:00:00	3600	47.7	65.7	39	53.1	51.2	44.7	42.1
30Nov 13	11:00:00	3600	49.4	79.9	38.7	53	51.1	43.2	40.9
30Nov 13	12:00:00	3600	47.6	68.8	37.7	52.9	51.2	43	40.4
30Nov 13	13:00:00	3600	48	70.7	36.7	53	51.1	42.8	39.3
30Nov 13	14:00:00	3600	47.6	71.6	36.4	53	51.3	42.6	38.8
30Nov 13	15:00:00	3600	46.3	64.2	37.1	52.1	50.3	42.4	39.5
30Nov 13	16:00:00	3600	46.6	65.1	37.9	52.6	50.5	41.8	39.5
30Nov 13	17:00:00	3600	46.1	65.9	37.6	51.6	49.4	41.1	39.3
30Nov 13	18:00:00	3600	44.3	61.2	36.9	50.4	47.9	40.5	38.7

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30Nov 13	19:00:00	3600	43.8	62.9	36.4	49.8	47.1	39.6	38.1
30Nov 13	20:00:00	3600	44.4	60.5	35.9	50.8	47.7	39.6	37.6
30Nov 13	21:00:00	3600	43.5	61.8	36	49.9	46.1	39.5	38.1
30Nov 13	22:00:00	3600	41.7	63.5	35.4	46.7	42.4	38.3	36.9
30Nov 13	23:00:00	3600	41.5	61.5	34.8	46.7	41.8	38	36.5
01Dec 13	00:00:00	3600	45.8	69.4	35.6	49.8	45.6	38.6	37.3
01Dec 13	01:00:00	3600	40.6	59.9	35.8	44.1	40.9	38.5	37.2
01Dec 13	02:00:00	3600	40.8	62.1	34.8	43.9	40.8	38.5	37.3
01Dec 13	03:00:00	3600	40.1	62.5	34.7	41.1	39.9	38.4	37.1
01Dec 13	04:00:00	3600	38.6	60.1	33.6	40	39.2	37.2	35.6
01Dec 13	05:00:00	3600	38	62.5	32.7	39	38	36.2	34.7
01Dec 13	06:00:00	3600	41.7	63.9	32.7	44	41	37.6	35.4
01Dec 13	07:00:00	3600	43.4	62.9	35.7	48.7	45.7	39.8	37.6
01Dec 13	08:00:00	3600	43.3	68.2	36.6	47.5	44.9	40.4	38.7
01Dec 13	09:00:00	3600	52	82	37.2	52.1	48.8	41	39.2
01Dec 13	10:00:00	3600	48.1	71.3	37.3	52.5	49.7	41.6	39.3
01Dec 13	11:00:00	3600	48.9	77.4	36.4	52.8	50.6	42.8	39.2
01Dec 13	12:00:00	3600	44.6	66.3	32.9	49.9	48.1	41.3	37.2
01Dec 13	13:00:00	3600	49.9	83.7	32.9	50.3	48.6	41.3	36.6
01Dec 13	14:00:00	3600	44.4	66.2	32.3	49.7	47.9	40.3	35.7
01Dec 13	15:00:00	3600	47.9	78.4	31.4	52	49.9	41.7	35.6
01Dec 13	16:00:00	3600	44.2	63.5	31.2	51	48.8	38	33.8
01Dec 13	17:00:00	3600	45.6	63.5	35	51.4	49.1	41.5	38.3
01Dec 13	18:00:00	3600	45.3	66.8	34.3	50.5	47.6	39.5	36.6
01Dec 13	19:00:00	3600	43.5	61.3	31.9	49.9	47.5	38.1	35.4
01Dec 13	20:00:00	3600	59.5	79	32.8	64.7	55.7	39.6	35.3
01Dec 13	21:00:00	3600	43	62.5	33.8	49.1	45.2	38.3	36.1
01Dec 13	22:00:00	3600	41.9	60.8	34.1	46.7	42.7	38	36
01Dec 13	23:00:00	3600	39	57.9	33.4	41.8	38.3	36.2	35.2
02Dec 13	00:00:00	3600	41	62.7	34.5	45.5	41.3	36.8	35.6
02Dec 13	01:00:00	3600	37.2	58.7	33.4	37.9	37.5	36.2	35.1
02Dec 13	02:00:00	3600	33.8	57	26.9	36.1	33.6	30.7	28.6
02Dec 13	03:00:00	3600	36.7	59.6	28.3	38.8	38.1	35.6	31.1
02Dec 13	04:00:00	3600	37.1	59.3	29.1	38.2	35.5	33.1	31.3
02Dec 13	05:00:00	3600	38.9	58.9	29.8	42.3	40.7	37.4	33.7
02Dec 13	06:00:00	3600	43.3	58.1	37.8	46.8	44.7	41.8	39.7
02Dec 13	07:00:00	3600	50.2	67.2	40.9	55.6	53.9	46.2	42.7
02Dec 13	08:00:00	3600	53.2	67.6	45	57.1	55.8	52	48.5
02Dec 13	09:00:00	3600	52	78.9	40.2	55.8	54.7	50.4	46.5
02Dec 13	10:00:00	3600	52.1	77.6	35.4	55.8	53.7	47.5	39.8
02Dec 13	11:00:00	3600	51.2	66.3	42.4	56	54.5	49	45.9
02Dec 13	12:00:00	3600	50.5	80.2	38.4	53.6	52.3	47.9	45.1
02Dec 13	13:00:00	3600	48.9	65.2	35.5	53.6	52.3	46.6	39.8
02Dec 13	14:00:00	3600	52.8	69.8	43.8	57.4	55.7	50.9	47.4

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02Dec 13	15:00:00	3600	53	67.9	43.7	57.4	55.9	51.6	47.8
02Dec 13	16:00:00	3600	51.7	71.2	43.7	55.8	54.6	50.1	46.7
02Dec 13	17:00:00	3600	49.3	67.5	36.4	54.8	52.9	45.7	39
02Dec 13	18:00:00	3600	46.5	66.7	36.2	52.4	50	40.7	38.1
02Dec 13	19:00:00	3600	45.4	61.8	36.5	51.7	49.7	40.8	38.5
02Dec 13	20:00:00	3600	44.9	64.8	37	50.9	48.3	40.6	39
02Dec 13	21:00:00	3600	43.9	64.7	36.7	49.4	46.2	41.5	39.5
02Dec 13	22:00:00	3600	42.6	57.8	38.1	46.7	43.2	41	39.7
02Dec 13	23:00:00	3600	40.9	55	37.4	42.7	41.3	39.7	38.5
03Dec 13	00:00:00	3600	39.8	53.5	36.3	41.3	40.3	38.9	37.9
03Dec 13	01:00:00	3600	39.3	58.2	35.3	40.7	40.1	38.4	37
03Dec 13	02:00:00	3600	40.8	59.8	35.5	42.6	41.9	39.8	38.2
03Dec 13	03:00:00	3600	37.6	58.7	33.3	40.1	39.2	36.8	35.2
03Dec 13	04:00:00	3600	38.3	59.2	33.2	39.7	38.6	36.6	35.2
03Dec 13	05:00:00	3600	40.4	58.6	33.4	42.5	40.6	38.4	36.3
03Dec 13	06:00:00	3600	43.7	61.2	36.4	49	45.2	41.4	38.8
03Dec 13	07:00:00	3600	51.6	72.6	41.1	56.6	54.8	48.3	43.1
03Dec 13	08:00:00	3600	55.5	78.5	43.6	59.7	58.2	53.3	49.2
03Dec 13	09:00:00	3600	54.3	81.1	43.2	58.4	56.9	51.8	47.1
03Dec 13	10:00:00	3600	52.4	78.8	41.1	56.5	55.2	49.9	43.5
03Dec 13	11:00:00	3600	58.1	76.8	47.8	63.9	62.8	54.5	51.6
03Dec 13	12:00:00	3600	64.1	83.4	41.4	68.3	67	62.9	50
03Dec 13	13:00:00	3600	61	84.8	39.2	66.9	64.4	53.6	42.8
03Dec 13	14:00:00	3600	66.4	88.6	53.7	70.9	69.2	64.3	61
03Dec 13	15:00:00	3600	62.8	84.2	50.9	67.2	64.9	60	55.8
03Dec 13	16:00:00	3600	63.2	86.7	45.2	68.1	65.7	60	52
03Dec 13	17:00:00	3600	48.8	63.7	39.3	54.2	52.6	45.7	41.4
03Dec 13	18:00:00	3600	47.8	70.8	40.1	52.5	50.6	43.5	41.6
03Dec 13	19:00:00	3600	47.1	66.2	39.8	51.9	50.2	43.9	42
03Dec 13	20:00:00	3600	46.3	65	40	51.4	48.9	43.5	41.6
03Dec 13	21:00:00	3600	45.4	60.4	39.4	50.3	48.2	43.1	41.4
03Dec 13	22:00:00	3600	45.6	62.8	38.7	50	48.2	43.5	41.2
03Dec 13	23:00:00	3600	42	60.4	37.1	45.7	44.1	40.7	39
04Dec 13	00:00:00	3600	40.7	57.4	34.6	44.6	41.6	38.2	36.6
04Dec 13	01:00:00	3600	38.8	58.5	33.6	40.3	38.2	36.4	35.2
04Dec 13	02:00:00	3600	37.5	60.9	32.2	37.8	37.1	35.6	34.3
04Dec 13	03:00:00	3600	36.5	57.7	31.2	38	37.1	34.9	33.1
04Dec 13	04:00:00	3600	39.9	60.8	31.6	41.1	38.3	36	34.4
04Dec 13	05:00:00	3600	40.5	60.2	34	42.6	41	38.6	36.4
04Dec 13	06:00:00	3600	45.4	63.4	36.9	51	48	42.7	39.8
04Dec 13	07:00:00	3600	56.1	78.1	41.8	60.8	59.8	49.6	44
04Dec 13	08:00:00	3600	64.4	84.7	48.6	70.2	68.2	58.3	54.5
04Dec 13	09:00:00	3600	60.8	83.5	46.1	65.4	62.6	57.4	54.3
04Dec 13	10:00:00	3600	60.3	85.9	41.2	65.7	63.2	53.1	43.8

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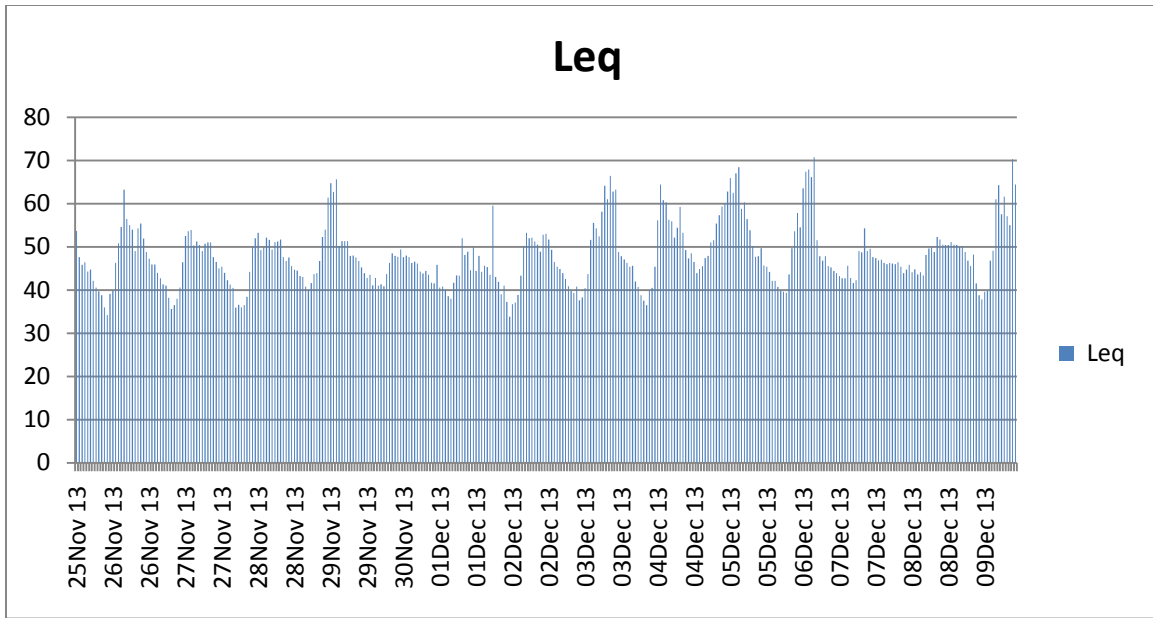
04Dec 13	11:00:00	3600	56.3	73.4	47.3	58.9	57.9	55.4	53.1
04Dec 13	12:00:00	3600	55.9	70.8	41.8	58.8	57.9	55.5	50.4
04Dec 13	13:00:00	3600	52.1	71.1	40.7	56.7	55.8	49.7	43.1
04Dec 13	14:00:00	3600	54.4	82.9	46.6	56.8	55.9	53.5	51.2
04Dec 13	15:00:00	3600	59.2	89.8	44.9	64.3	59.8	53.6	50.3
04Dec 13	16:00:00	3600	53.2	66.9	43.9	57.1	55.9	52.3	46.5
04Dec 13	17:00:00	3600	49.2	67.5	41.1	53.7	52.3	46.7	43.2
04Dec 13	18:00:00	3600	47.3	61.3	40.8	53.1	50.8	44.1	42.3
04Dec 13	19:00:00	3600	48.5	70.5	40.6	52.9	51.3	44.5	42.4
04Dec 13	20:00:00	3600	46.5	72.3	39.7	51.2	49.1	43.5	41.5
04Dec 13	21:00:00	3600	43.9	57.6	39.6	47.7	45.5	42.6	41.3
04Dec 13	22:00:00	3600	44.9	58.2	40	49	47	43.4	42
04Dec 13	23:00:00	3600	45.5	58.5	39.4	50.2	48.1	43.6	41.5
05Dec 13	00:00:00	3600	47.4	60.3	39.3	52.4	50.5	45	41.7
05Dec 13	01:00:00	3600	47.9	62.2	37.7	52.9	51.2	45.8	41.5
05Dec 13	02:00:00	3600	51	66.3	41	56.1	54.1	48	44.3
05Dec 13	03:00:00	3600	51.5	63.7	39.5	56.8	54.9	48.9	44.7
05Dec 13	04:00:00	3600	55.4	67.8	43	60.9	59	52.4	47.4
05Dec 13	05:00:00	3600	57.3	70.5	45.6	62.2	60.4	54.8	49.9
05Dec 13	06:00:00	3600	59.3	73.6	47.6	64.8	62.8	56.6	52.1
05Dec 13	07:00:00	3600	60.1	72.9	47.4	65.1	63.4	57.8	53.1
05Dec 13	08:00:00	3600	62.8	76.7	50.9	68.6	66.6	59.9	55.6
05Dec 13	09:00:00	3600	65.9	83.9	49.2	71.3	69.2	62.6	57
05Dec 13	10:00:00	3600	62.5	81.6	49.2	68.4	66.5	58.8	54.7
05Dec 13	11:00:00	3600	67	83.2	50.3	73.1	71.1	62.6	55.5
05Dec 13	12:00:00	3600	68.4	87.5	42.5	75.3	72.7	60.1	51.9
05Dec 13	13:00:00	3600	58.8	78.4	40.7	64.7	62.1	54.7	46.7
05Dec 13	14:00:00	3600	60.3	86.4	45.9	65.3	63.1	56.7	51.5
05Dec 13	15:00:00	3600	56.4	71.1	45.2	62.3	59.5	52.9	48.9
05Dec 13	16:00:00	3600	53.8	71.2	45.1	58.9	56.5	51.1	48
05Dec 13	17:00:00	3600	50.1	64	40.8	54.9	53.6	48.1	43.6
05Dec 13	18:00:00	3600	47.7	67.7	40.7	52.8	51.2	44.6	42.4
05Dec 13	19:00:00	3600	47.8	66.7	39.7	53.1	51.1	43.7	41.3
05Dec 13	20:00:00	3600	49.7	73.5	38.9	54.4	52	43.7	41.3
05Dec 13	21:00:00	3600	45.7	63.6	38.8	51.7	49.3	42	40.4
05Dec 13	22:00:00	3600	45.4	64	39.3	50.7	47.9	41.9	40.5
05Dec 13	23:00:00	3600	44.2	62.9	38.4	48.5	46.6	42	40.4
06Dec 13	00:00:00	3600	42.1	58.6	37.4	46	43.1	40.6	39.3
06Dec 13	01:00:00	3600	42.1	58.6	36.8	44.9	43.4	40.9	39.3
06Dec 13	02:00:00	3600	40.7	54.7	36.4	43.2	42	39.8	38.4
06Dec 13	03:00:00	3600	39.8	57.1	34.5	41.9	40.7	38.7	37.3
06Dec 13	04:00:00	3600	39.6	57.4	34.7	41.9	40.8	38.6	37.1
06Dec 13	05:00:00	3600	39.4	57.3	34	41	40.3	38.6	37.1
06Dec 13	06:00:00	3600	43.6	61.2	37.4	48.2	44.9	41.5	39.4

Report N&V Stn 3 Church of Ireland Building Grangegorman 25 Nov to 9 Dec 2013 EM

06Dec 13	07:00:00	3600	49.7	64.6	40.2	54.9	53.7	47.2	42.1
06Dec 13	08:00:00	3600	53.6	72.9	44.9	57.6	56.1	52.5	48.7
06Dec 13	09:00:00	3600	57.8	73.3	41.5	63.3	61.2	53.9	48.3
06Dec 13	10:00:00	3600	54.5	75.8	41.3	60.8	58	50.3	44.5
06Dec 13	11:00:00	3600	63.5	78.7	48	68.9	66.5	60	52.7
06Dec 13	12:00:00	3600	67.4	84	42.6	72.6	70.2	61.7	51.2
06Dec 13	13:00:00	3600	67.9	86.7	40.6	75.4	71.1	51.8	43.7
06Dec 13	14:00:00	3600	66.1	86.8	46.8	73	69.5	57.4	50.9
06Dec 13	15:00:00	3600	70.7	101.1	43.6	65.6	61.6	53.6	47.3
06Dec 13	16:00:00	3600	51.5	71.3	41.6	55.7	54.1	48.4	44
06Dec 13	17:00:00	3600	47.8	66.7	40	53.1	51.4	44.2	42.1
06Dec 13	18:00:00	3600	46.8	59.4	40.9	52.4	50.6	43.7	42.1
06Dec 13	19:00:00	3600	47.8	64.5	40.2	53.5	51.5	43.8	41.8
06Dec 13	20:00:00	3600	45.5	62.3	39.6	50.9	48.6	42.5	41.1
06Dec 13	21:00:00	3600	45.2	62.1	39.1	51	48.1	42.1	40.7
06Dec 13	22:00:00	3600	44.4	63.2	39.5	49	46	41.9	40.8
06Dec 13	23:00:00	3600	43.9	62.5	39.5	47.8	44.8	41.9	40.8
07Dec 13	00:00:00	3600	43.2	63.7	38.9	46.2	43.6	41.6	40.3
07Dec 13	01:00:00	3600	42.7	59.4	38.9	45.8	43.5	41.5	40.3
07Dec 13	02:00:00	3600	42.7	65.1	38.4	44.5	43.3	41.6	40.3
07Dec 13	03:00:00	3600	45.6	68.4	39.2	49.6	45.6	42.5	41.1
07Dec 13	04:00:00	3600	42.8	60	38.4	45	43.8	41.7	40.3
07Dec 13	05:00:00	3600	41.6	61	37.2	43.3	42.5	40.6	39
07Dec 13	06:00:00	3600	42.3	62.7	35.9	44.3	42.6	40.5	38.8
07Dec 13	07:00:00	3600	49	74.1	38.5	54.3	52	42.5	40.3
07Dec 13	08:00:00	3600	48.7	76	39.5	53.1	50.4	43.6	41.6
07Dec 13	09:00:00	3600	54.3	82.5	40.7	56.7	55.6	52.1	43.4
07Dec 13	10:00:00	3600	49	73.4	39.6	54.9	53.1	45.4	42.2
07Dec 13	11:00:00	3600	49.5	71.4	39.8	55	52.4	44.2	41.6
07Dec 13	12:00:00	3600	47.6	66.9	39.4	52.7	51	44.5	41.7
07Dec 13	13:00:00	3600	47.4	64.8	39.8	53	51.3	44.1	41.7
07Dec 13	14:00:00	3600	46.9	60	39.7	52.4	50.7	43.8	41.7
07Dec 13	15:00:00	3600	47	60.4	39.3	52.6	50.9	43.6	41.4
07Dec 13	16:00:00	3600	46.3	65.4	39.2	51.8	49.7	43.2	41.2
07Dec 13	17:00:00	3600	46	67.2	39.7	51.4	49	42.8	41.4
07Dec 13	18:00:00	3600	46.3	64.8	40	51.4	49.3	43.2	41.5
07Dec 13	19:00:00	3600	46.1	60.8	40.4	51.6	49.3	43.4	42
07Dec 13	20:00:00	3600	46	63.2	39.8	51.1	48.8	43.6	42.1
07Dec 13	21:00:00	3600	46.4	63.4	39.3	51.9	50.1	43.6	41.4
07Dec 13	22:00:00	3600	45.4	62	39.6	50.5	48	42.9	41.3
07Dec 13	23:00:00	3600	43.9	62.6	39.6	47.2	44.8	42.5	41.3
08Dec 13	00:00:00	3600	44.7	62.2	39.4	49.4	46.8	42.6	41.3
08Dec 13	01:00:00	3600	45.8	73.1	39.4	46.9	44.6	42.4	41.2
08Dec 13	02:00:00	3600	44.1	59.3	39.8	47.8	45.6	42.9	41.4

Report N&V Stn 3 Church of Ireland Building Grangegorman 25 Nov to 9 Dec 2013 EM

08Dec 13	03:00:00	3600	44.8	62.7	39.7	48.1	46.5	43.4	41.8
08Dec 13	04:00:00	3600	43.6	64.3	38.1	46.3	45.1	42.7	40.8
08Dec 13	05:00:00	3600	44.1	61	34.9	48.6	46.7	42.3	39.6
08Dec 13	06:00:00	3600	43.4	64.8	37	47.9	45.6	40.8	38.8
08Dec 13	07:00:00	3600	48.1	64.3	37	54.5	53.1	42	39.6
08Dec 13	08:00:00	3600	49.6	80.2	38.7	51.3	48.8	43.2	41
08Dec 13	09:00:00	3600	49.9	76.5	39.9	53	51	45.7	43
08Dec 13	10:00:00	3600	48.8	64.5	41.9	53.2	51.8	46.9	44.1
08Dec 13	11:00:00	3600	52.3	79.6	41.6	55.3	53.5	48.1	44.7
08Dec 13	12:00:00	3600	51.7	65.6	42.9	56.5	54.9	49.6	45.8
08Dec 13	13:00:00	3600	50.5	76.9	42.4	54.8	53.3	48.4	44.7
08Dec 13	14:00:00	3600	50.4	66.1	43.2	54.7	53.5	48.6	45.7
08Dec 13	15:00:00	3600	50.4	65.4	43.1	54.8	53.2	48.5	45.7
08Dec 13	16:00:00	3600	51.1	76	42.5	55.6	54.1	49.2	45.3
08Dec 13	17:00:00	3600	50.5	64.7	42.7	54.9	53.6	48.5	45.6
08Dec 13	18:00:00	3600	50.4	63	42.7	55	53.6	48.5	45.2
08Dec 13	19:00:00	3600	50	64.1	42.5	54.8	53.2	48.1	45.1
08Dec 13	20:00:00	3600	50.1	69.4	42.2	54.7	53.2	47.6	44.7
08Dec 13	21:00:00	3600	48.8	66.8	41.5	53.3	51.1	46.4	43.9
08Dec 13	22:00:00	3600	46.8	63.2	40.1	51.3	49.5	44.7	42.4
08Dec 13	23:00:00	3600	45.5	62.8	39.2	49.6	48	43.7	41.6
09Dec 13	00:00:00	3600	48.2	62.8	38.7	52.6	50.9	46	42.4
09Dec 13	01:00:00	3600	41.5	60.8	35.3	44.7	43	39.6	37.7
09Dec 13	02:00:00	3600	38.8	62.7	33.3	40.9	39.9	37.6	35.9
09Dec 13	03:00:00	3600	37.8	64.3	32.1	39.8	38.6	36	34.3
09Dec 13	04:00:00	3600	39.6	60.6	33.6	41.2	39.8	37.5	36
09Dec 13	05:00:00	3600	39.8	59.8	33.8	41.8	40.8	38.5	36.4
09Dec 13	06:00:00	3600	46.8	72.7	37.3	49.6	46.2	42.4	39.8
09Dec 13	07:00:00	3600	49.1	74.8	41	53.8	52.4	45.7	42.8
09Dec 13	08:00:00	3600	61	84.3	43.1	66	63.2	55.8	50.1
09Dec 13	09:00:00	3600	64.3	84.8	41.2	69.3	67.1	58.7	51.3
09Dec 13	10:00:00	3600	57.5	81.5	39.8	63.4	60.4	51.3	42.9
09Dec 13	11:00:00	3600	61.6	80.2	46.2	68.2	65.4	55.8	51
09Dec 13	12:00:00	3600	57.1	71.2	43.1	63	60.7	52.7	47.3
09Dec 13	13:00:00	3600	55	75.1	44.3	58.4	56.6	52.8	49.4
09Dec 13	14:00:00	3600	70.3	86.9	47.1	77.7	76	60.4	52.7
09Dec 13	15:00:00	2934.7	64.4	86.5	45.3	68	63.6	55.5	49.4



6.0 Instrument Specification Sheets

Minimate Plus™

Advanced Vibration and Overpressure Monitor

Range of Applications:

- Blast-monitoring for compliance
- Near-field blast analysis
- Pile driving
- Construction activity
- Demolition activity
- Heavy Transportation
- Bridge monitoring
- Structural analysis
- Underwater blast monitoring
- 4 or 8 channel data acquisition
- Remote monitoring - Auto Call Home™
- Structural monitoring - Flex™

When we asked what you wanted in a vibration monitor, you said “Everything.” So, we designed the **Instantel® Minimate Plus™** vibration and overpressure monitor. Ever since, it has become a favourite of contractors, consultants, engineers and blasters, because it offers unrivalled features and versatility in a rugged and easy-to-use package.

Versatile

Use the **Minimate Plus** monitor with an **Instantel Standard Triaxial Geophone** (ISEE or DIN version) and an overpressure microphone (Linear or A Weight) to provide a rugged, reliable compliance monitoring system. Add the **Instantel 8-Channel** option and a single monitor may be used with two triaxial geophones and two microphones.

For more demanding monitoring applications, the **Instantel Blastware® Advanced Module** software provides the capability to monitor a broad selection of vibration and overpressure sensors, as well as sensors for structural and environmental measurements. Monitor vibration, ambient environmental conditions, and the movement of structural cracks, all at the same time, all using the same **Minimate Plus** monitor.

Intelligent

For remote installations, the **Instantel Auto Call Home™** feature will automatically transfer event files from field to office as they are recorded using a variety of wired or wireless modems. From there, the **Blastware Mail** feature of the **Blastware** software automatically distributes files or summary information to multiple e-mail or text messaging addresses.

Easy to use

Even with all of these features, the **Minimate Plus** system is still easy for anyone to use. A high-contrast LCD, eight-key tactile keypad, coupled with simple menu-driven operations, provides complete control and confidence.

Minimate Plus - everything you need and more.



Key Features

- **Instantel Histogram Combo™** mode allows capture of full waveform records while recording in histogram mode.
- **Auto Call Home** feature automates remote monitoring applications.
- Sample rates from 1,024 to 16,000 S/s, per channel with up to 65,000 S/s available on a single channel.
- Available **Instantel 8-channel** option allows for two standard geophones and two microphones to be operated from one **Minimate Plus** monitor.
- Non-volatile memory with standard 300-event storage capacity (optional 1,500-event capacity).
- Records waveform events up to 100 seconds long with standard setup, or up to 500 seconds with advanced setup.
- Continuous monitoring means zero dead time, even while the unit is processing.
- Any channel can be matched to a wide variety of sensors - geophones, accelerometers, or hydrophones.

Minimate Plus™

General Specifications

Minimate Plus

Channels	Microphone and Triaxial Geophone or 4 independent user-configurable channels (two Microphones and two Triaxial Geophones or 8 independent channels with optional 8-channel upgrade)
Vibration Monitoring (with Standard Triaxial Geophone)	
Range	Up to 254 mm/s (10 in/s)
Resolution	0.127 mm/s (0.005 in/s) or 0.0159 mm/s (0.000625 in/s) with built-in preamp
Accuracy (ISEE / DIN)	+/- 5% or 0.5 mm/s (0.02 in/s), whichever is larger, between 4 and 125 Hz / DIN 45669-1 standard
Transducer Density	2.13 g/cc (133 lbs/ft ³)
Frequency Range (ISEE / DIN)	2 to 250 Hz, within zero to -3 dB of an ideal flat response / 1 to 315 Hz
Maximum Cable Length (ISEE / DIN)	75 m (250 ft) / 1,000 m (3,280 ft)
Air Overpressure Monitoring	
Weighting Scales	Linear or A-weight
Linear Range	88 to 148 dB (500 Pa (0.072 PSI) Peak)
Linear Resolution	0.25 Pa (0.0000363 PSI)
Linear Accuracy	+/- 10% or +/- 1 dB, whichever is larger, between 4 and 125 Hz
Linear Frequency Response	2 to 250 Hz between -3 dB roll off points
A-weight Range	50 to 110 dBA
A-weight Resolution	0.1 dBA

Waveform Recording

Record Modes	Manual, Single-shot, Continuous
Seismic Trigger	0.125 to 254 mm/s (0.005 to 10 in/s)
Acoustic Triggers	
Linear	100 to 148 dB
A-weight	55 to 110 dBA
Sample Rate	1,024 to 16,384 S/s per channel (independent of record time), up to 65,536 S/s in single-channel mode with advanced software (max 8,192 S/s per channel for 8 channels)
Record Stop Mode	Fixed record time, Instantel® AutoRecord™ record stop mode
Record Time	1 to 100 seconds (programmable in one-second steps) or 500 seconds plus 0.25 seconds pre-trigger
AutoRecord Time	Auto window programmable from 1 to 9 seconds, plus a 0.25 second pre-trigger. Event is recorded until activity remains below trigger level for duration of auto window, or until available memory is filled. Recording uninterrupted by event processing - no dead time
Cycle Time	
Storage Capacity	
Full Waveform Events	300 one-second events at 1,024 S/s sample rate (1,500 event capacity with optional memory upgrade)
Event Summaries	1,750 (8,750 event capacity with optional memory upgrade)

Histogram Recording

Record Modes	Histogram and Instantel Histogram Combo™ (monitor captures triggered waveforms while recording in Histogram mode)
Recording Interval	2, 5 or 15 seconds; 1, 5 or 15 minutes
Storage Capacity	46,656 intervals - 3 days at 5-second intervals or 102 days at 15-minute intervals (with memory upgrade - 15 days at 5-second intervals or 540 days at 15-minute intervals)

Physical Specifications

Dimensions	81 x 91 x 160 mm (3.2 x 3.6 x 6.3 in)
Weight	1.4 kg (3 lbs)
Battery	Rechargeable 6 V sealed gel cell - capacity for 210 hours of continuous monitoring
User Interface	8-key keypad with domed tactile keys
Display	4-line x 20-character, high-contrast, backlit LCD
PC Interface	RS-232
Auxillary Inputs and Outputs	External Trigger, Remote Alarm, coordinate download from GPS
Environmental	
LCD Operating Temperature	-10 to 50°C (14 to 122°F)
Electronics Operating Temperature	-20 to 60°C (-4 to 140°F)
Remote Communications	Compatible with Telephone, GSM, Cellular, RF, Satellite, Short-haul modems and Ethernet® device servers. Automatically transfers events when they occur through the Instantel Auto Call Home™ feature.
Additional Features	Monitor start/stop timer

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Telephone: (613) 592 4642
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714B0052 Rev 01 - Product Specifications are Subject to Change

The World's Most Trusted Vibration Monitors



Model 812

There exists a need to select an instrument that will do just what you need it to do. The 812 was designed with this in mind. For example, a consultant that works heavily in the industrial hygiene sector will greatly benefit from having the Model 812, a hand held data logging integrating sound level meter and a personal noise dosimeter.

The condenser microphones used with our Model 812 allows for a wider dynamic range and greater level of accuracy. The Models 812 meets the IEC and ANSI requirements for Type 1, Precision Integrating Sound Level Meters.

Fundamental to each of these instruments is an integrating sound level meter. Each features true RMS and dual Peak detectors that operate simultaneously. Each has Slow, Fast, and Impulse detector rates. Each has A and C frequency weighting filters.



Application

- ▶ Sound Level Measurements
- ▶ Community Noise Assessment
- ▶ Environmental Noise Monitoring
- ▶ Statistical Analysis
- ▶ Transportation Noise/Passby Measurement
- ▶ Sonic boom/artillery fire measurements
- ▶ Production Line Testing

Features

- ▶ ANSI/IEC Type 1 integrating SLM
- ▶ 110 dB dynamic range
- ▶ Long Term logging capabilities: Interval and Time histories
Statistics - user selectable Ln values: 4 in the 812
- ▶ Slow, Fast and Impulse Detectors
- ▶ True RMS with two separate Peak detectors
- ▶ A & C weighting
- ▶ 1/2" condenser microphone - extension cables up to 20 feet available
- ▶ 64K bytes of memory (812) / 256 K bytes of memory (820)
- ▶ AC/DC Output
- ▶ RS-232 Interface
- ▶ Remote communications via modem (820 only)

Support

 [Model 812 Support Page](#)

PC Software

 [DNA Software](#)

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7.0 Instrument Calibration Certs

Calibration Certificate

Part Number: 716A0403
Description: MINIMATE PLUS W/EXT. GEO
Serial Number: BE8875
Calibration Date: April 13, 2013
Calibration Equipment: 718A1501

InstanTel certifies that the above product was calibrated in accordance with the applicable InstanTel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds InstanTel specifications

InstanTel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at InstanTel and is available upon request.

The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. InstanTel recommends that products be returned to InstanTel or an authorized service and calibration facility for annual calibration.

Calibrated By: _____

Martin Hogue



Calibration Certificate

Part Number: 716A0403
Description: MINIMATE PLUS W/EXT. GEO
Serial Number: BE9246
Calibration Date: April 22, 2013
Calibration Equipment: 718A1501

InstanTel certifies that the above product was calibrated in accordance with the applicable InstanTel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds InstanTel specifications

InstanTel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at InstanTel and is available upon request.

The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. InstanTel recommends that products be returned to InstanTel or an authorized service and calibration facility for annual calibration.

Calibrated By: _____  _____
Martin Hogue



Calibration Certificate

Part Number: 716A0403
Description: MINIMATE PLUS W/EXT. GEO
Serial Number: BE10439
Calibration Date: November 20, 2013
Calibration Equipment: 718A1501

InstanTel certifies that the above product was calibrated in accordance with the applicable InstanTel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds InstanTel specifications

InstanTel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at InstanTel and is available upon request.

The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. InstanTel recommends that products be returned to InstanTel or an authorized service and calibration facility for annual calibration.

Calibrated By: _____



Vipulan Mathi





Certificate of Calibration

Certificate Number: 20236

Sound Level Meter Larson Davis Model 812

Client: Environmental Measurements
Unit 12, Tallaght Business Centre
Whitestown Business Park
Co.Dublin 24, Ireland

Instrument Make: Larson Davis
Instrument Model: 812
Serial Number: 0720

Microphone Make: PCB
Microphone Model: 377B02
Serial Number: 102891

Preamplifier Make: Larson Davis
Preamplifier Model: 828
Serial Number: 2529

Calibrator Make: not supplied
Calibrator Model:
Calibrator Serial Number:
Calibrator Adaptor:
Calibrator Certification Ref:

Extension Cable: not supplied

This is to certify that the above instrument was calibrated according to MTS Calibration Ltd. Measurement Procedures and was found to comply as summarised below. The measurements were carried out using the Test Equipment listed below, all of whose calibrations are traceable to UK National Standards. The management controls of MTS Calibration Ltd. are registered in its current Quality Manual, and are designed to be in compliance with BS EN ISO/IEC 17025: 2005. Copies of the relevant certificates, test procedures and test results, together with the traceability of test equipment are filed with MTS Calibration Ltd. and extracts are available on request.

This instrument was tested in accordance with the recommendations of BS 7580: Part 1 1997 (not all tests were performed) with the following results:

	<i>Manufacturer's Specification</i>	<i>BS EN 60651 Type 1</i>
Self-Generated Noise:	Complies	no specification – measured 16.9 dB(A)
Dynamic Linearity – electrical response:	Complies	Complies between 23.0 and 128.9 dB(A)
Frequency Weighting A - electrical response:	Complies	Complies
Frequency Weighting A - acoustic response:	Complies	Complies
Frequency Weighting C - electrical response:	Complies	Complies
Crest Factor:	Complies	Complies
Burst (RMS accuracy):	Complies	Complies
Time Weightings F, S, I (Detector):	Complies	Complies
Microphone Response:	Complies	Complies (assessed as overall acoustic specification)

**Calibrated at 114.02 dB re 20µPa, 250 Hz – calibration offset = 8.1 dB
Polarisation Voltage 0 V**

Test Equipment:

Equipment	Manufacturer	Model	Serial No.	Traceability Ref.	Cal. Due
Acoustic Calibrator 250Hz	Larson Davis	CAL250	4483	TE 116	October 2014
Real-Time Frequency Analyser	Larson Davis	2900	0510	TE 165	June 2013
Digital Multimeter	Agilent	34401A	MY41046986	TE 152	July 2013
Signal Generator	Hewlett Packard	33120A	US34007158	TE 163	July 2013

Date of Receipt: 7th March 2013
Date of Calibration: 7th to 8th March 2013
Date of Certificate: 8th March 2013

Authorised Signatory

Stuart Cowling
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MTS Calibration Ltd

Company Registration Number: 06588525 England and Wales

The Grange Business Centre, Belasis Avenue, Billingham TS23 1LG, England

Telephone: 0044 1642 876410 Fax: 0044 1642 876411 E-Mail: dmarsh@slmcal.co.uk or tsherris@slmcal.co.uk <http://www.slmcal.co.uk>

Certificate of Calibration and Conformance

Certificate Number 2013-169819

Instrument Model 812, Serial Number 0767, was calibrated on 04FEB2013. The instrument meets factory specifications per Procedure D0001.8160, ANSI S1.4 1983, IEC 651-Type 1 1979, and IEC 804-Type 1 1985.

Instrument found to be in calibration as received: YES

Date Calibrated: 04FEB2013

Calibration due:

Calibration Standards Used

MANUFACTURER	MODEL	SERIAL NUMBER	INTERVAL	CAL. DUE	TRACEABILITY NO.
Larson Davis	LDSigGn/2209	0277 / 0109	12 Months	20MAR2013	2012-156690

Reference Standards are traceable to the National Institute of Standards and Technology (NIST)

Calibration Environmental Conditions

Temperature: 23 ° Centigrade

Relative Humidity: 16 %

Affirmations

This Certificate attests that this instrument has been calibrated under the stated conditions with Measurement and Test Equipment (M&TE) Standards traceable to the U.S. National Institute of Standards and Technology (NIST). All of the Measurement Standards have been calibrated to their manufacturers' specified accuracy / uncertainty. Evidence of traceability and accuracy is on file at Provo Engineering & Manufacturing Center. An acceptable accuracy ratio between the Standard(s) and the item calibrated has been maintained. This instrument meets or exceeds the manufacturer's published specification unless noted.

The collective uncertainty of the Measurement Standard used does not exceed 25% of the applicable tolerance for each characteristic calibrated unless otherwise noted.

The results documented in this certificate relate only to the item(s) calibrated or tested. A one year calibration is recommended, however calibration interval assignment and adjustment are the responsibility of the end user. This certificate may not be reproduced, except in full, without the written approval of the issuer.

"AS RECEIVED" data same as shipped data.
Tested with PRM828- 2557

Signed: Ron Harris
Technician: Ron Harris



Certificate of Calibration

Certificate Number: 21100

Sound Level Meter Larson Davis Model 812

Client: Environmental Measurements
Unit 12, Tallaght Business Centre
Whitestown Business Park
Co.Dublin 24, Ireland

Instrument Make: Larson Davis	Microphone Make: PCB
Instrument Model: 812	Microphone Model: 377B02
Serial Number: 0776	Serial Number: 119789
Preamplifier Make: Larson Davis	Calibrator Make: not supplied
Preamplifier Model: 828	Calibrator Model:
Serial Number: 1728	Calibrator Serial Number:
	Calibrator Adaptor:
Extension Cable: not supplied	Calibrator Certification Ref:

This is to certify that the above instrument was calibrated according to MTS Calibration Ltd. Measurement Procedures and was found to comply as summarised below. The measurements were carried out using the Test Equipment listed below, all of whose calibrations are traceable to UK National Standards. The management controls of MTS Calibration Ltd. are registered in its current Quality Manual, and are designed to be in compliance with BS EN ISO/IEC 17025: 2005. Copies of the relevant certificates, test procedures and test results, together with the traceability of test equipment are filed with MTS Calibration Ltd. and extracts are available on request.

This instrument was tested in accordance with the recommendations of BS 7580: Part 1 1997 (not all tests were performed) with the following results:

	<i>Manufacturer's Specification</i>	<i>BS EN 60651 Type 1</i>
Self-Generated Noise:	Complies	no specification – measured 17.6 dB(A)
Dynamic Linearity – electrical response:	Complies	Complies between 25.6 and 129.6 dB(A)
Frequency Weighting A - electrical response:	Complies	Complies
Frequency Weighting A - acoustic response:	Complies	Complies
Frequency Weighting C - electrical response:	Complies	Complies
Crest Factor:	Complies	Complies
Burst (RMS accuracy):	Complies	Complies
Time Weightings F, S, I (Detector):	Complies	Complies
Microphone Response:		Complies (assessed as overall acoustic specification)

Calibrated at 114.02 dB re 20µPa, 250 Hz – calibration offset = 8.4 dB
Polarisation Voltage 0 V

Test Equipment:

Equipment	Manufacturer	Model	Serial No.	Traceability Ref.	Cal. Due
Condenser Microphone	Larson Davis	2541	4295	TE 102	October 2013
Acoustic Calibrator 250Hz	Larson Davis	CAL250	4483	TE 116	October 2014
Real-Time Frequency Analyser	Larson Davis	2900	0510	TE 165	July 2014
Digital Multimeter	Agilent	34401A	MY41046986	TE 152	July 2014
Signal Generator	Hewlett Packard	33120A	US34007158	TE 163	July 2014

Date of Receipt: 11th October 2013
Date of Calibration: 15th – 17th October 2013
Date of Certificate: 17th October 2013

Authorised Signatory *BA Sku*

BP Stuart Cowling
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MTS Calibration Ltd

Company Registration Number: 06588525 England and Wales

The Grange Business Centre, Belasis Avenue, Billingham TS23 1LG, England

8.0 Photographs



Monitoring Station No 1 @ Laundry Building



Monitoring Station No 2 @ Mortuary Building



Monitoring Station No 3 @ C of I Church